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JANUARY 1971

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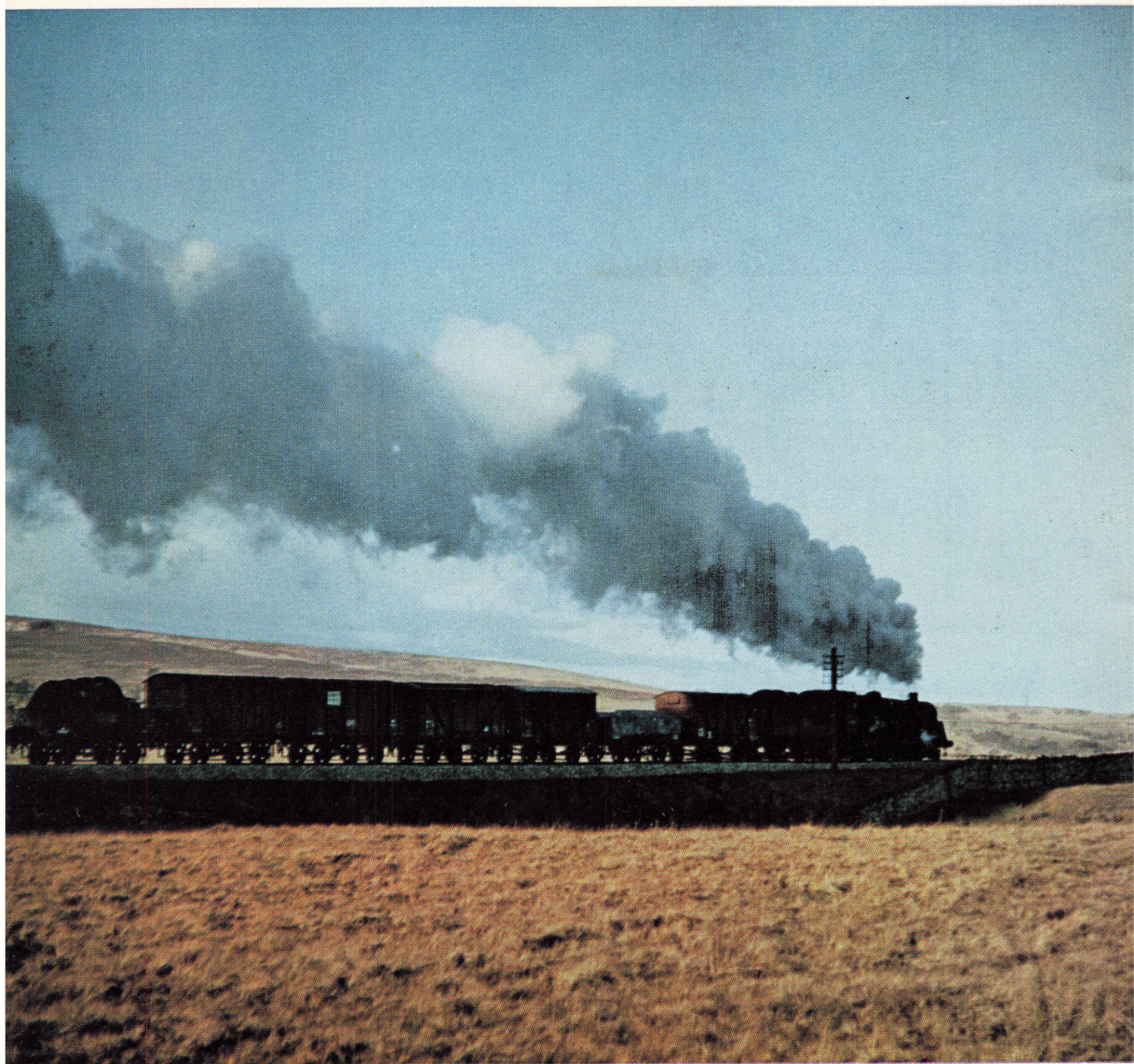
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*May we take this opportunity to wish all our members past, present and future a
happy and prosperous New Year.*



ABOVE: It is just over three years since steam working came to an end on the West Coast main line over Shap. The evening sun silhouettes a standard class 5 4-6-0 climbing towards the summit during the last weeks of steam working in 1967.
[B. A. Reeves]

FRONT COVER: Stanier class 8 2-8-0 No 48448 storms towards Copy Pit with an early morning freight to Burnley on February 24, 1968.
[A. Stewart]

RAILWAY WORLD

JANUARY 1971

VOL 32 NO 368

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DURING a recent visit to Euston in the evening peak service we were surprised to notice the number of trains arriving from the North several minutes early, as much as eight minutes in one case but most five or six minutes before time. In view of complaints we hear of late running it was commendable to see the procession of high speed expresses following one another, in some cases at no more than five minute intervals, turning up at or before their booked time. Clearly drivers on the Western Lines electric services have that keenness of spirit to maintain time and also to regain lost time, for it is rare to receive reports from this route of lethargic running and loss of time other than by mechanical or electrical failure or bad regulation. In contrast there are too many occasions elsewhere when BR drivers seem loathe to extend their locomotives to regain lost time and even after permanent way or station losses are sometimes content to run at speeds lower than would be required for a normal timekeeping run, and lose even more time in consequence. This attitude is not confined to main lines and some years ago during a period of regular travelling on the North London line, which is not the easiest line to operate, with its regular interval electric multiple-unit service between Broad Street and Richmond interspersed with a frequent inter-regional freight service, one particular driver could be relied on to lose three minutes in running between Willesden and Richmond, a scheduled journey of 14min. This he achieved by over-emphasising speed limits and by shutting off power almost as soon as he had left one station and coasting to the next.

Elsewhere in this issue Cecil J. Allen comments on some poor runs which he has experienced on the Great Eastern line from Liverpool Street to Norwich in recent weeks and stresses driving technique variations which play havoc with timetables. Early running is as bad as late running and merely proves that either the timetable is too generous or that driving discipline is slack. In certain European countries drivers take pride in maintaining the timetable exactly as scheduled. Loss of time through out-of-course checks is an incentive to get back to schedule as soon as possible within the prescribed speed limits and early running is almost unthinkable.

Much research is undertaken these days in assessing motive power potential related to given loads or speeds. If the right mentality to timekeeping is to be developed by BR we must have realistic schedules capable of observance, precise marking of permanent and temporary speed restrictions and clear instructions given by locomotive inspectors to drivers who persistently lose time or otherwise drive below the standard that is needed for precise timekeeping.

* * *

From reports emanating from North America, it is clear that *Flying Scotsman* is wintering in Canada and Alan Pegler is said to be talking about doing another tour in that continent this year. So far, no official statement has been forthcoming as to the future of the locomotive but it is fast becoming apparent that any ideas that it will run in Britain in 1971 should be dispelled. And with that salutary thought we wish all our readers a Happy New Year.

Editor: G. M. KICHENSIDE
Associate IRSE

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News of the month

New Derby laboratory

A new £250,000 laboratory for testing British Rail's 150mph Advanced Passenger Train and other new high-speed passenger and freight rolling stock, was opened at Derby last October. The new laboratory forms part of BR's 20 acre Railway Technical Centre—the largest and most comprehensive centre of its kind in the world covering research, engineering design and development, workshops and supplies. The new laboratory will be used initially to test thoroughly Advanced Passenger Train components and test vehicles, both powered and trailer cars, at the train's maximum design speed of 155mph. Stability and riding tests will be carried out on the laboratory's huge roller test rig—one of the largest in the world—which is capable of simulating speeds up to 200mph. These tests will form an important part of the development programme of the APT's unique suspension system which has been designed to enable the train to negotiate curves in complete safety at speeds 50 per cent faster than trains of conventional design.

West Coast resignalling starts

The London Midland Region has now placed contracts with the Westinghouse Brake & Signal Co for the signalling of the main line between Weaver Junction (Cheshire) and Glas-

gow, which is to be converted to electric traction to provide electrified services throughout between London and Glasgow by 1974. Work on the London Midland Region's section of the route—from Weaver Junction to Carlisle—will commence shortly. The existing signalling equipment, which is mainly of the semaphore type worked from numerous lineside boxes, will be replaced by modern electrical and electronic equipment. Train movements over the 132 route miles between Weaver Junction and Carlisle will be controlled from three new power signalboxes located at Warrington, Preston and Carlisle. The new power signalbox at Warrington will control all train movements over 50 route miles (160 single track miles), of railway extending from Weaver Junction to just beyond Wigan. From this latter point to north of Carnforth, a further 114 route miles (263 single track miles), will be controlled from the new power signalbox at Preston. The remaining distance extending over 104 route miles (210 single track miles) to Kirkpatrick, will be under the control of the new Carlisle power signalbox.

In the Scottish Region new signalling and installation work totalling £5.7m are being supplied for 300 miles of single track on the West Coast main line electrification scheme and for resignalling between Cadder and Greenhill, near Falkirk, on the Glasgow-Edinburgh line by AEI-General Signal Limited. The signalling systems to be installed on the West Coast main line include the provision of a push-button control console at Motherwell, controlling 124 route miles, and an extension to the control panel at Glasgow Central. Computer-based train describers will be installed in all four of the new power boxes.

New Dartford signalbox

A new centralised power signalbox, covering 100 miles of track and replacing 31 old signalboxes was brought into use by the SR in November. The whole scheme, costing £3m, covers most of the Greenwich and North Kent lines, the Bexleyheath line and the Dartford Loop, all heavily-used suburban routes in the South East London complex. The new signalbox is one of 13 which will ultimately control the whole of the Southern Region. A further stage will be added later this year when the box takes over control between Dartford and Strood.

Oxford-Worcester line singling

About 25 miles of the Oxford-Worcester main line between Moreton-in-Marsh and Norton Junction, Worcester, is to be converted from double to single track early this year as an economy measure. At the same time, the single line will be made up to modern high-speed standards. The conversion will have no effect on journey times over the route—which at this point carries 14 Inter-City and four local passenger trains a day—and the 1971 services will be essentially the same as for this year. The change to single track, together with track improvements, will take about three months to complete. Double track will be retained at Moreton-in-Marsh and Evesham to permit trains travelling in opposing directions to pass each other. A significant reduction in operating costs will result from the use of single line, and plans are now being drawn up to convert to single track the remainder of the route between Wolvercot Junction, (Oxford), and Moreton-in-Marsh.

BELOW: The Western Region has at long last started the rebuilding of Oxford Station. Demolition of the up platform began in the Autumn as a first stage.

[John H. Bird



CIE orders BR coaches

British Rail Engineering Ltd has received an order worth approximately £2.6m from Coras Iompair Eireann, to supply 62 railway carriages, 22 steam heating boiler brake vans and 11 electric generator brake vans.

These passenger coaches which will be air-conditioned and based upon the current Mark IID British Rail design, will be built at Derby. Delivery will commence this year.

Kyle service threat

The Scottish Region plans to discontinue all railway passenger services between Inverness and Kyle of Lochalsh from May 3, 1971, involving the closure of Garve, Lochluichart, Achanalt, Achnasheen, Glencarron, Achnashellach, Strathcarron, Attadale, Stromeferry, Duncraig, Plockton, Duirinish, and Kyle of Lochalsh stations.

If objections are made to the proposals the closure cannot take place unless the Minister of Transport so decides after considering a report from the Transport Users Consultative Committee for Scotland which will investigate any cases of hardship which might arise.

New LT timetables

London Transport introduced new timetables on the Bakerloo, Piccadilly, Circle, District and parts of the Metropolitan Line from November 30. An increased peak service will be scheduled on three sections of the Underground network—the Wimbledon branch of the District; the Stanmore branch of the Bakerloo; and the Metropolitan's Hammersmith & City service between Whitechapel and Barking. Shortage of train guards remains a major problem—particularly at Underground depots in west and north-west London, where competition for the limited labour available is keenest. Because of this, it is still not possible to reinstate the through peak service on the Bakerloo Line to and from Harrow & Wealdstone over the London Midland Region tracks, but if the recent improvement in recruitment continues, every consideration will be given to restoring this service as soon as possible.

On Saturdays a revised service will be introduced on the Piccadilly Line. At the western end of the line the Uxbridge service will reverse at Rayners Lane after about 15.00 and passengers will use the Metropolitan Line between Rayners Lane and Uxbridge. At the eastern end of the line the new pattern of service throughout Saturdays will mean that trains will reverse in sequence at Wood Green, Arncliffe Grove and Cockfosters. In West London during the Saturday midday period, trains which now reverse at Northfields or Acton Town will turn instead at Barons Court.

On the Chesham branch of the Metropolitan Line a revised method of operation will be introduced so that only one train is on the branch at any one time. This will allow the present two full-length through trains from London to continue to operate in each peak. It will, however, entail a slight reduction in the shuttle service as, when the through trains are running to and from Chesham, the shuttle train will have to remain in the bay platform at Chalfont & Latimer until the line is clear. Not more than two return shuttle journeys will be lost in either of the Monday to Friday peak periods. This move permits the closure of Chesham signalbox.

Heathrow link

While London Transport is delighted that the Government has accepted the case for the Heathrow Airport Underground link it regrets the Government's refusal to make a grant for a line which will be heavily used by international travellers and provincial visitors as well as by Londoners. This means that three-quarters of the cost will have to be met by London Transport by way of a loan repayable from the increased revenue that the line will produce.

Tenders for construction between Hounslow West and Hatton Cross will be invited immediately GLC authorisation is received. It is hoped that work on this part of the extension will start three months later and be completed in 1974. Completion of the section between Hatton Cross and Heathrow depends on the conclusion of joint planning arrangements with the British Airports Authority. Initially, existing Piccadilly Line stock will be used on the extension, with four seats in each car removed to allow luggage racks to be provided. However, it is hoped that, as part of the next stage of the Underground rolling stock replacement and rehabilitation programme, the GLC will authorise new trains of the latest design incorporating provision for luggage.

Belgian Marine joins Sealink

British Rail Shipping and International Services Division has negotiated a link with the Belgian Marine Administration in 1971, and the establishment of the first British Rail service to Ostend in 1972. The Belgian decision to join Sealink means that eleven ships—five car ferries and six passenger ships—will be added to the combined fleets of British Rail, French Railways and the Zeeland Steamship Company to bring their total strength to over 70 vessels.

Accidents

In his report (HMSO 6s) into a head-on collision between an electric multiple-unit and a diesel-hauled freight train at Monmore Green near Wolverhampton

on April 8, 1969, Lt Col I. K. A. McNaughton finds that it arose when the driver of the emu passed a colour-light signal at danger. A route had been set for the freight train from the down Birmingham-Wolverhampton main line to the up line over a facing crossover and into Wolverhampton New Depot. Following a signal failure at Wolverhampton Station the emu driver was instructed to pass the failed signal at danger and proceed at caution. Evidence showed that his speed was excessive on leaving the station, and he continued past the signal protecting the move into the goods depot, ran through the depot connection points and took the facing crossover to collide head-on at about 45 mph with the freight train. Both the drivers of the emu and the freight were killed and 30 passengers injured. Although the first two coaches of the AM10 emu were badly damaged they held their shape in the collision and only the driving cab of the leading coach was crushed. It was remarkable that passengers travelling in the leading coach escaped with only minor injuries.

A collision at Waterloo between an empty train being propelled by a diesel locomotive and a stationary parcels train standing in the platform on December 5, 1969, arose because the driver and shunter of the empty stock train failed to observe a shunting signal at danger says Major C. F. Rose in his report (HMSO 7s 6d). The empty train had been drawn out from platform 14 to release the train locomotive and although the first of two shunt signals had been cleared for the propelling move to start, the signalman had inadvertently pulled a point lever instead of the second shunt signal. This set up a route into an occupied platform and since the crew did not see the second shunt signal at danger the accident could not be averted. Damage to the parcels train was extensive; eight vans were derailed and some struck the adjoining 14.30 Waterloo-Weymouth passenger train. Only one passenger was slightly hurt. The Inspecting Officer, while holding the shunter responsible, points out that it was impossible for him to see the signal concerned and communicate with the locomotive crew at the same time. In future two men will accompany such shunting moves.

The problem of running a track lining machine which does not operate track circuits on a line worked by track circuit block was brought out in a report (HMSO 3s) by Major P. M. Olver into a collision at Lapworth on November 28, 1969, when a Paddington-Birmingham express running under clear signals, overtook and collided with a track lining machine. Special regulations were in force requiring the person in charge of the machine to advise the signalman of its position, particularly



LEFT: To mark the 125th anniversary of the Jamaican Railway, the Jamaican Government has issued three railway stamps, a 3 cent stamp portraying an early 2-2-2 of 1845, a 15 cent showing a 1944-built 4-8-0, one of the last steam types built for the country, while the 50 cent stamp shows an Alco Bo-Bo diesel.

TOP RIGHT: The recent RPSI "Colum-cille" tour from Belfast ran over Ballykelly airfield crossing on the Derry main line, where No 171 is seen passing in front of a Shackleton.

[W. S. Boomer]

RIGHT LOWER: James Bond has been at work on the Southern confusing drivers by altering gradient posts! This one, which should be 607, is between Christs Hospital and Billingshurst.

[J. Scrase]

when leaving the main line or passing controlled colour-light signals. After the route had been set for the lining machine, the signalman had not seen his track circuit indications show occupied and assumed that the machine had not moved from a siding to the main line. He cancelled the route and reset it for the express. The signalman, said Major Olver, clearly did not understand the action he should have taken when moving a machine of this type. Nevertheless, the Inspecting Officer adds that it is undesirable for such a machine not to operate track circuits and all Civil Engineering machines in future must be capable of operating track circuits and running as normal trains instead of under special instructions.

DVR appointment

Mr J. T. Holder has been appointed Managing Director of the Dart Valley Railway.

After an early apprenticeship as an engine driver on the Romney Hythe & Dymchurch Railway and war service he was Manager of the RHDR until 1948 when he became Sales Manager of the publishing house of Ian Allan Ltd. In 1953 he transferred to the Economist Newspaper where he was Circulation Manager and latterly Circulation Director of that paper and a Director of Ian Allan Ltd.

Glue coupling

During October a special train made a journey from Hythe to New Romney and return on the RHDR. It was hauled by *Green Goddess* and consisted of 16 coaches plus passengers and the coupling between tender and train was joined by glue! This was a special demonstration organised by the Borden Chemical Co the makers of "Power Pack", the twin Epoxy Resin used to join the special coupling, which had previously been sawn in half. Driver George Barlow deliberately made a couple of snatch starts with no adverse effect on the strength of the bond. It

is estimated that the total weight of the train was in the region of 50 tons and the snatch strain was estimated at least three times that figure.

MR Project Group report

During the autumn the Group has been active dismantling underfloor signalling equipment from A and B boxes at Nottingham Midland station and removing the historically valuable mechanisms from the semaphore signals which used to be in the station roof above the platforms. Concurrently a comprehensive programme of retrieving selected items from 20 demolished signal boxes in the area between Hathern, Nottingham and Langley Mill was undertaken. As a result the Group has now obtained the bulk of the signalbox equipment required for the Midland Railway exhibit. Further details from The Secretary, Midland Railway Project Group, c/o Derby Museum, The Strand, Derby.

KWVR news

Another locomotive has been added to the Worth Valley collection, a former Taff Vale 0-6-2T built by Neilson Reid in 1889. It began life as TVR No 85, then became GWR No 426 before being sold in 1929 to a colliery and finally passing into National Coal Board ownership. This locomotive needs a great deal of work but the KWVR is confident that it will ultimately become a runner.

No 31, one of the Manchester Ship Canal 0-6-0Ts, has finally moved from its apparent permanent position in Haworth Yard car park. The engine has had its main bearing journals machined and its bearing brasses modified to include a white metal facing; it is now in Haworth shed undergoing a major rebuild and it is hoped to have it back in service early in 1971.

Another really heavy repair has been the fitting of a brand new boiler and firebox to No 62 one of the line's three Corby, Robert Stephenson & Haw-

thorn's 0-6-0STs. The locomotive is now being rebuilt for the 1971 summer service.

The passenger service saw another newcomer during October when the "Green Dragon" alias L&Y 0-6-0 No 957 became the oldest, and the fourteenth member of the present KWV collection of engines to enter passenger service. As No 957 is still somewhat delicate this was only a token entry into service, and consisted of no more than one round trip on the last train of the day, the weight of which had been reduced specially.

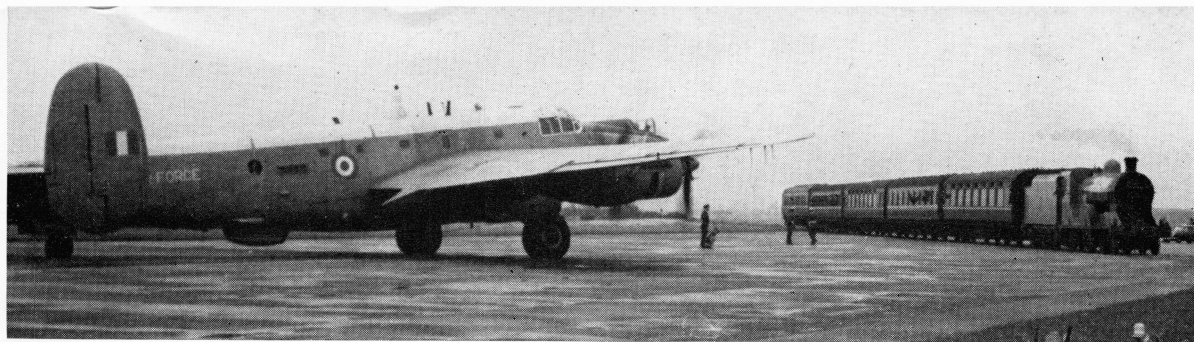
Wight Locomotive Society

The Wight Locomotive Society's ex LSWR 02 0-4-4T No 209 (preserved as W24 *Calbourne*) was in steam and moved within station limits under its own power at Newport Station on two occasions in November, having successfully passed its boiler test a short time before. Test steamings are being carried out at intervals to prepare for the removal of the Society's train from Newport to Havenstreet as soon as possible, where, subject to negotiations still in progress with the Isle of Wight County Council (owners of the former railway land) and British Rail, it is intended to establish an Island Steam Rail Centre on the length of line from there to Wootton.

These plans depend on the necessary capital being raised and funds are still urgently required. Donations should be sent to the Secretary, WLS, 27 Carmarthen Avenue, East Cosham, Portsmouth, PO6 2AB, who will also supply further details of the scheme to anyone interested. It is envisaged that a company will be set up to encourage investment to the project.

Hereford changes

At a meeting held at the premises of H. P. Bulmer (Hereford) Ltd. on November 19, between the Hereford Group and the Council of the Great Western Society Ltd it was agreed to wind up the Hereford Group of the



Great Western Society Ltd and that its functions, including stewardship of Locomotive No 6000 *King George V* be transferred to the newly formed "6000 Locomotive Association".

Action at Lakeside

Life at Haverthwaite Station, headquarters of the Lakeside Railway, has been hectic recently, with deliveries to the branch by both road and rail. In November, two 0-6-0 saddle-tanks were delivered by road from private store at Doncaster, and were re-railed in the station yard; they were built by Hudswell-Clark Ltd, one in 1921 and the other in 1929, for Stewarts & Lloyds Ltd, of Corby, but have seen service in other industries, notably Renshaw Iron-works.

The Lakeside Railway Society AGM will be held at the "Swan Hotel", Newby Bridge, on January 16, at 15.00hr. This will be followed by a members-only special from the newly re-opened Newby Bridge Halt. Motive power will be provided by either one of the Fairburn 2-6-4Ts or by 0-4-0ST *Caliban*, which has recently been fitted with a vacuum brake.

Clan Line steamed

During the weekend of October 10/11 the preserved Merchant Navy Class Pacific No 35028 *Clan Line* was steamed at Liss for the first time in nearly three years. The event was not without its problems for a main feed pipe was found to be fractured which had to be welded before the steam test could proceed. During the test the locomotive made a number of short trips up and down the track at the southern end of the former Longmoor Military Railway with crews picked from Society members who are also qualified BR motive power staff. Following the move from Longmoor Downs the Society has purchased a former LSWR 56ft brake third which has been adapted as a workshop. The Society has been building up a comprehensive range of tools and equipment including arc and gas welding plant, lathe, pillar drill, compressor, hydraulic press and forge equipment. Spares on hand include sets of coupling and connecting rods and wooden patterns for Merchant Navy locomotives. Details of the Society can be obtained from Mr A. Clare, 331 Uxbridge Road, Acton, W.3.

Dean Forest RPS

The Dean Forest Railway Preservation Society was formed in February 1970 in order to secure the last section of the former Severn & Wye Railway as a working steam branch-line for the Severnside area.

The Chairman of the Society is Mr Mike Rees, of Coleford, Gloucestershire, and the Honorary Secretary is Mr B. J. Millard, "Sunrise", Coopers Hill, Gloucester.

East Lincolnshire sale

British Railways has arranged an auction sale of selected items from stations recently closed in East Lincolnshire. The sale is to take place in the Goods Shed, High Street East, Scunthorpe at 10.30 on Saturday, January 16, and catalogues are obtainable from the auctioneers Bell, Watson & Co, 127-131 High Street, Scunthorpe, Lincs.

Yorkshire Dales agreement

The Yorkshire Dales Railway Society, originally set up as the Embsay & Grassington Preservation Society, has reached agreement with British Railways for leasing the land and buildings at Embsay Station, near Skipton. The Yorkshire Dales Railway Company was recently incorporated to assume responsibility for the business activities of the Embsay Steam Centre and to acquire vintage road and rail rolling stock before the opening of a vintage transport centre next summer. The long term object of the Company is the re-opening of the Grassington Branch as a tourist railway and the Embsay site is a first step in that direction.

Leighton Buzzard Narrow Gauge Railway

The Leighton Buzzard Narrow Gauge Railway Society has recently appointed a Membership Secretary Mr D. Barrow, 7 St Andrews Road, Bletchley, Bucks, to handle enquiries and membership applications.

Waverley Association disbanded

The Waverley Association, the enthusiast body set up to support the Border Union Railway Company in its bid to re-open the Waverley route between Carlisle and Edinburgh has been disbanded. During the last few months there has been a total lack of informa-



tion from the Border Union Railway Company for release to the Waverley Association and the Association therefore assumes that either the project to reopen the Waverley route under the present scheme is not attainable or that the BURC will not divulge information to its supporting body. The Association Committee has reluctantly decided that it can no longer continue in being. The Waverley Association is unable to deal with any correspondence regarding either the project or the BURC.

Railway World binding

We shall shortly be able to accept the 12 1970 issues of *Railway World* for binding. The standard binding includes cover and most advertisements removed, silver lettering on the spine and the frontispiece and index included. Regrettably the price has increased from previous years' and is £1 18s 0d (£1.90). We can still accept previous years' bindings but at the new price plus 25 per cent. Any variation from the standard binding will be charged at 50 per cent extra. Send your copies for binding, accompanied by your name and address and your remittance to Ian Allan Ltd, Binding Department, Terminal House, Shepperton, Middlesex, between February 1 and February 28. Please note that we cannot handle the bindings before this date and bindings received after February 28 will be held until July since the following months will be devoted to the other Ian Allan periodicals. To keep costs as low as possible, bindings are dealt with in bulk and once our main order has been despatched to the binders we cannot deal with individual orders until the summer. If you want a receipt to notify you of the safe arrival of your loose copies, will you please enclose a stamped addressed envelope.



Locomotive running past and present—No 220

Timekeeping and City of Truro

By CECIL J. ALLEN, FRSA, MInst

IF there is one thing more than another that is needed in British locomotive operation today, it is respect for timetables and the enforcement of a common standard of locomotive handling. One does not want to overdo invidious comparisons between British and French methods, but there is no doubt that the French both are and for long past have been far ahead of us in this matter. In steam days a late start to a French crew, with the incentive of a timekeeping bonus, was an encouragement to make up the lost time with a minimum of delay, but in general, having won back to schedule, booked times would be strictly adhered to for the remainder of the journey. No French fireman would complain of being overworked in such conditions; to him the extra effort was well worth while.

Running well ahead of time has always been discouraged in France and is rarely practised. Again in France, in the days of steam the rules concerning the management of locomotives were meticulous in the extreme, and enginemmen obeyed the letter of the law without question. In this country, locomotive inspectors could give advice on steam footplates, but in general the methods of handling were left to the discretion of the crew. The British standard of punctuality has never been as high as that on the railways of France.

To-day, with diesel and electric power, the opportunities for the enforcement of uniform standards are far greater than ever before. Locomotive defects from time to time may affect the power output of individual motive power units but this is the exception rather than the rule. Otherwise, with any given load on any given gradient the movement of the controller to any given position, according to the type of locomotive, should within fairly narrow limits produce a predictable speed. If a train is behind time, the full power of the locomotive, whether diesel or electric, can be used for time recovery without involving any extra effort on the part of the second member of the locomotive crew.

On the other hand, to continue using full power to such an extent that a train gets well ahead of schedule can upset the working over a busy route just as much as late running. Working timetables may have their faults, but in general they lay down precise paths of the trains, and with present day motive power any failure to keep to those paths—apart from errors in train regulation that produce signal checks, or permanent way speed restrictions costing more than the recovery times allow for in the schedules—is inexcusable.

Let me now give some examples of what I have in mind. In my December article I described an excellent run from Liverpool Street to Cambridge on the Great Eastern Line;

LEFT: Brush type 4 No 1777 waits to leave Liverpool Street with the 13.30 to Norwich on April 6, 1970. [Leslie Riley

since then I have had a very different experience on the Great Eastern Colchester main line, on a journey to Norwich and back. As with the Cambridge line, public patronage has made it necessary to increase the standard London-Norwich train formations, which are now of ten coaches, averaging about 350 tare tons in weight. With the tight times in force, and with the gradients duly considered, this means some fairly hard work even for the 2,750hp Class 47 diesels normally employed. This is particularly the case with the intermediate expresses, which have to make six calls in their schedules of 2hr 20min down and 2hr 23min up. As to how these schedules are laid out, a little more later on; meantime, this is what happened on my return journey.

Going down, No 1527 headed a train of 351 tons tare and 370 tons gross (365 tons or less from Ipswich onwards). Starting a minute late, we made a leisurely exit from Liverpool Street, and as a result of two checks to 40mph before and 30mph after Romford, passed Shenfield 4min late. Nevertheless no particular haste was shown down to Chelmsford. A signal check preceded the stop here, and as the result of a points failure, we restarted 11min late, but were stopped again a few moments later. So Witham was passed 13½min behind time, but here the driver at last showed the power of his mount by working us up to 87mph, increased, after a drop to 82 up the 1 in 222 to Hill House, to 90mph after Marks Tey. Colchester was reached 12½min late, and smart station work there got us away 12min only behind schedule.

Now the next point-to-point timings certainly are very tight. From Colchester to Manningtree, 7.8 miles beginning with 1½ miles up at 1 in 123-144, a time of 8½min start to stop leaves nothing whatever to spare, neither does 10½min for the 9.3 miles from Manningtree to Ipswich, including three miles up at 1 in 145-157 past Bentley, and the slow approach from Halifax Junction to the Ipswich stop. No great energy was shown over these sections, however; the two lengths concerned took 9min 27sec and 11min 33sec. So Ipswich was reached just over 14min late; but 5min here is an unnecessarily generous allowance, and we were less than 13min late away. From Ipswich to Stowmarket the 11.95 miles took 12min 36sec, (12min booked) with no speed higher than 76mph; up the 1 in 131 of Haughley bank we could do not better than 52mph, after which, between Finningham and Mellis, speed was allowed to fall, down gradients slightly easier than level, from 75 to 71mph (where it ought easily to have been up to 90). Then followed a 20mph permanent way check, so that the 14.25 miles from Stowmarket to Diss took 17min 58 sec instead of the allotted 14min, and with 2min overtime at the Diss stop we were 18min late in resuming our lethargic progress.

Worst of all was the descent from Tivetshall, down which the driver who had been doing 87 to 90mph from Witham to Marks Tey, along slightly harder than level track, allowed his speed to drop to no more than 68mph beyond Flordon, thus almost deliberately throwing away time. The schedule allows 8min recovery time from Diss to Norwich; we took 22min 44sec for the 19.95 miles, instead of the nominal 30min, but 44 sec over the booked time with the recovery allowance deducted. The end of this inglorious run was thus an arrival at Norwich 11min late. When it is realised that no more than a notch or two more on the controller might have recovered nearly all the arrears of time, the inexcusability of such slack locomotive handling is apparent. The date of this run was Friday, October 9 last.

One cannot help thinking, however, that with the present 10-coach loads these intermediate Norwich schedules might do with some adjustment. As they are at present arranged, there is no possibility with ten-coach loads of recovering any arrears of time between Chelmsford and Diss, except by cutting a very generous 5min station allowance at Ipswich; and to confine the allowance for time recovery entirely to 8min between Diss and Norwich means that these trains must frequently be running out of their paths south of Diss. It might be more realistic to allow 9½ instead of 8½min from Colchester to Manningtree, 11½ instead of 10½min from there to Ipswich, to cut the Ipswich stop from 5min to 4 and leave there 1min later than now, then to allow 13 instead of 12min from Ipswich to Stowmarket, and 15 instead of 14 min from Stowmarket to Diss, which would leave 5min final recovery allowance instead of the present unduly liberal 8min.

My return run from Norwich, on the 11.40 2hr train, was equally disappointing. No 1523 was the locomotive, with the same load as on the down journey. After a 3½min late start, waiting a connection, this driver distinguished himself by dropping all but 2min on the initial 15min allowance for the 14.35 miles from Norwich to Tivetshall—certainly a tight time, as it includes the 15mph slack over the Wensum swingbridge and the mile at 1 in 84 up that follows—though it was clear that nothing like full power was being used at the head end. Then followed a bad permanent way slowing at Burston, after which there was a painfully slow recovery, with speeds no higher than 69mph beyond Diss, 61 minimum up the 1½ miles at 1 in 132 to Mellis, and 72-69mph up the easy grades past Finningham. A little more energy was shown beyond Stowmarket, with speed gradually rising from 82 to 87mph by Bramford, but with an extremely slow approach to Ipswich the arrival there was 8½min behind time. The 46.25 miles from Norwich had taken 46min 32sec instead of the 42min allowed.

From Ipswich onwards time was dropped steadily. The 20½min allowed for the 17.1 miles to Colchester stop, which includes 3min recovery allowance, took 19min 15sec, a net loss of 1½min. From Colchester to passing Chelmsford we should have taken 17min, but actually needed 21min 53sec, including a 20mph permanent way slowing just short of Chelmsford station. Between Chelmsford and Liverpool Street there were no out-of-course checks, but despite a further 6min recovery allowance, the 29.8 miles took 34min 7sec instead of the 37min scheduled, again a net loss of 3 min. Including a total recovery time of 9min, the 51.7 miles from Colchester to Liverpool Street needed 56min precisely, or 53min net, against a schedule of 54min gross or 45min net, and so we arrived 9½min behind time. Such disappointing running is something I have not known on the Great Eastern line for a long time past.

In describing these runs, I have commented on point-to-point times in working timetables that are very difficult of observance, and in some cases, indeed, impossible. One such on the Great Eastern Colchester main line is 5min from leaving Colchester to passing Marks Tey, which includes 1½miles at 1 in 165-128 up to Stanway. A Clacton electric might just manage this if driven all out, but certainly it would be out of the question for a 2,750hp diesel with a ten-coach load of 350 tare tons; on the run just described we took 6min 55sec. Also I do not think I have ever known the 15 min allowance from Norwich start up to Tivetshall strictly kept; the nearest that I can recall has been 15min 32sec, but over 16min has been more usual.

Many similarly extravagant demands might be quoted on other lines. One that has been frequently mentioned in these columns is the 5min for the 2.5 miles from passing Finsbury Park to stopping at Kings Cross, which is practically impossible for a heavy train if the 8mph speed restriction at the exit from Gasworks Tunnel is strictly observed, and the time is taken to the dead stand in the terminus.



LEFT: Some new correspondence has recently come to light regarding *City of Truro's* alleged record run in 1904 which the author discusses in the accompanying article. *City of Truro* is seen here in company with the GW 2-6-0 No 6313 on an Ian Allan excursion to Swindon and Eastleigh passing Grafton South Junction on April 10, 1958. [Ivo Peters

Even the otherwise well-arranged electric timetable of the London Midland Region out of Euston has its occasional faults. One on which I have commented in the November issue of *Modern Railways* is between Crewe and Manchester, where the standard stopping time of expresses at Stockport is no more than a single minute, after which they are expected to pass Longsight, 4.1 miles in, 4½min, and to take no more than 2½min for the remaining 1.8 miles to a dead stand at Manchester Piccadilly. On my own last down run, with the 10.00 from Euston, we reached Stockport 1½min early, stopped there for 3½min instead of the allotted 1min, took 9min 58sec from Stockport to Piccadilly start to stop, instead of the booked 7min (including a moderate signal check), and arrived 4½min late. As with Finsbury Park to Kings Cross, this is not an isolated booking, but one which affects a large number of important expresses.

Scotland can show similar examples. From Gretna Junction, passed at reduced speed for the curve, up expresses from the Glasgow & South Western line in general are allowed no more than 8min for the 8.5 miles to the stop at Carlisle, though this booking certainly follows a recovery time of 4 min between Annan and Gretna. With the 07.40, 9.35 and 15.10 from Glasgow to the south, however, the 8min shrinks to a quite impossible 7min. In the reverse direction the 08.00 and 14.05 from Euston are expected to pass Gretna in 7min from the Carlisle start, and I doubt if this time is ever achieved either, even by expresses taking the restriction-free Caledonian route northwards. One necessary preliminary to any punctuality drive on British Railways, in addition to a stricter enforcement of schedule observance, is a close examination of working times to ensure that they do not include point-to-point bookings which are incapable of observance.

And now, for a complete change of subject, I want to deal with a communication of very considerable interest which I discovered recently among my records during one of the periodical turnouts which my study requires if I am not to be completely buried in paper. From where this particular document originated I have no record; I have no recollection, either, of ever having seen it published when the subject to which it refers was very much in the eye of the railway public.

It was in the July 1934 issue of the *Railway Magazine*, in my "British Locomotive Practice and Performance" article, that I published a letter from A. H. Holden which submitted to a critical analysis the claim of the late Charles Rous-Marten that the Great Western Railway 4-4-0 locomotive *City of Truro*, on May 9, 1904, had worked a mail special up to a speed of 102.3 mph in the descent of Wellington bank in Somerset. The conclusion of this analysis, which had been most carefully made, was that the 100mph level had

never actually been reached. Needless to say, the effect of this revelation was sensational. For months afterwards my article quoted from readers' letters, both supporting Mr Holden's contentions and also violently opposing them, but with the light that has been thrown since on various inaccuracies in Rous-Marten's records, the general consensus of opinion now is that Mr Holden's arguments against the record were soundly based.

I have looked up my articles in the second half of 1934, and have verified that the communication that I am now about to quote never appeared in any of them; why I never used it I am unable to say. Anyway, here it is.

"Mr Y. arrived at Plymouth on the Saturday night from India, coming ashore at just after 10 o'clock", it begins, without any explanation as to who "Mr Y.", was or of his relationship with Rous-Marten. "His baggage was addressed through a forwarding agent; he was only carrying a small case of necessities for one night in the hotel, but before deciding to stop in Plymouth he went to Millbay Station to enquire if any London train was available before the Sunday Mail Special. There was a train, but a very poor one—many stops, picking up milk—arriving only a few hours before the Mail. In view of the uncertainty of Sunday trains on his own line, Mr Y. decided to remain at the Great Western Hotel. He was just about to return from Millbay when Mr Rous-Marten hailed him. After a few hearty greetings Mr Rous-Marten explained the momentous prospects of the run on Sunday, and prevailed on Mr Y. to remain to take part in it, which he did.

"No details whatever were mentioned of the early part of the run except that both records agree to 1/5th of a second. It was only after passing Wellington that differences arose. Speed was very high, and both timers were concentrating intensely—they were several feet apart and no remarks were possible". It should here be recalled, of course, that the two recorders were travelling in a mail van and not in an ordinary coach. "Suddenly and unexpectedly Mr Rous-Marten gave a great shout. Mr Y. called 'Wait a second', as the mile-post was just then in view. He took his record and turned to Mr Rous-Marten, who was most excited and was quoting 102.3 miles an hour as the speed.

"Mr Y. after a few seconds strongly disputed the figure and gave 95.8 miles an hour. He was at a loss to account for his friend's shout of exultation before the mile-post came into view and suggested that the latter had taken his reading from some other post. Mr Rous-Marten was exceedingly angry at his version even being questioned and the quarrel persisted till arrival at Paddington. Here they consulted the engine-crew and the inspector on the footplate. All three agreed that they were travelling very fast, but would not admit that any very extraordinary speed was attained.

They had been much more exercised about a gang of platelayers who took no notice of their approach and were nearly run down. Mr. Rous-Marten became furious when he received no support from the locomen and dashed away with every appearance of anger.

"Mr Y. was so positive that he was right that within a week he took a train to Wellington, and saw the stationmaster who laughed when he heard the story, and said they often heard such tales; he ascribed all the trouble to a permanent way section post close to the mile-post. He very kindly sent a messenger to fetch the permanent way ganger and all three set off up the line to the spot. Having located the section post, they paced along the line to the mile-post. They then re-measured the distance back to the mile-post. Their estimates varied from 108 to 110 yards. This reading of, say, 109 yards reduces Mr Rous Marten's figure to agree within a minute fraction of 95.8 miles an hour, as given by Mr Y. The permanent way section post was still in position four or five years ago, though the old metal mile-post had been replaced by one of modern standard pattern.

"Mr Y. describes his old friend Mr Rous-Marten as very 'pontifical' and highly choleric in his later years, and adds that the Rev W. J. Scott"—another well-known recorder of locomotive performance at that period—"found his attitude intolerable, his bad temper, abuse, and refusal to see any other point of view than his own having lost him all his friends".

Now there are various weaknesses in this lively account. In the first place, May 9, 1904, was a Monday and not a Sunday. Also the Mail Special started from Millbay at 9.23 in the morning, and not, as might be inferred from the "few hours before the Mail" Paddington arrival of the rejected slower train, well on in the day. Thirdly, the mails were from a Transatlantic liner, whereas "Mr Y." is represented as having arrived at Plymouth from India, although this may have been by another ship. One can only assume that when Mr Rous-Marten persuaded "Mr Y" to remain at his hotel, it was overnight from the Sunday to the Monday, and that in this matter the letter I have quoted was in error. But the worst mistake is the claim that "Mr Y" and Rous-Marten interviewed the engine-crew of *City of Truro* on arrival at Paddington; this was, of course, impossible, as engines had been changed at Pylle Hill, Bristol, and the engine into Paddington was the single-driver *Duke of Connaught*, with another crew altogether. Locomotive Inspector Flewellen (incidentally called "Llewellyn" by Rous-Marten in his subsequent articles) was the only observer who had ridden on both footplates throughout from Plymouth.

The only point of major interest in the account from which I have quoted is the paragraph relating to the critical mile-post and section post, just under 110yd apart. It is unfortunate that this paragraph does not reveal which was the precise mile-post concerned. It seems generally agreed that the maximum speed was attained after passing Wellington and not before, which the latter confirms. The brake application necessitated by the platelayers on the line seems to have been made as the train was passing Poole Siding, and this would suggest the $\frac{1}{4}$ -mile between posts 169 $\frac{1}{2}$ and 169 $\frac{3}{4}$, or possibly that between posts 169 $\frac{1}{4}$ and 169, as the critical length. Well, Charles Rous-Marten has left us a puzzle for which a conclusive solution may never be found.

Incidentally, in correspondence which took place in 1934 following the publication of my July article in that year, C. B. Collett, the then Chief Mechanical Engineer of the Great Western, made the following comment. "There is one point which I do not think is sufficiently appreciated by some of the advocates of very high speed runs, and that is the great importance of having the outer rail of the curves correctly superelevated for the speeds. This, on any railway where varying speeds are run, has, of course, to be compromised, and is never really sufficient for the normal

high speeds, and (what I think is not appreciated) is quite inadequate for the extra high speeds.

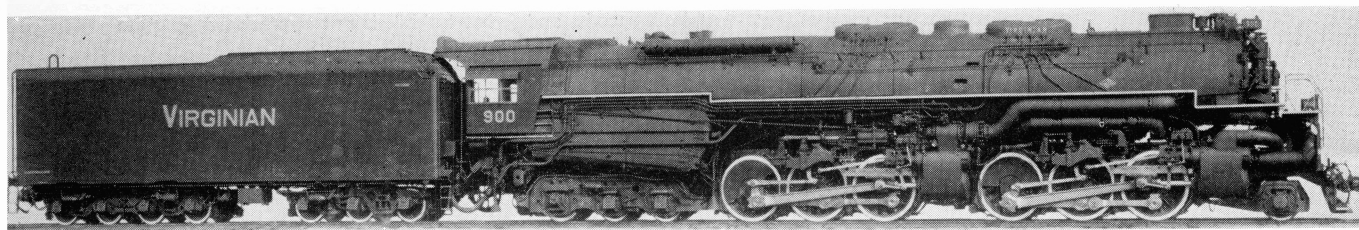
"In this connection, the matter was brought home to me very vividly when we were recently carrying out a preliminary run for a high speed trip which was to have taken place with the mail train a little while ago, and we found that in running down a grade of 1 in 300 between Badminton and Somerford, where there are several curves, but of fairly flat radius, the insufficiency of the superelevation of the outer rail caused terrific flange friction, and this grinding against the outer rail absorbed, in running at high speed down this grade, as much power as pulling a heavy train up one of the steep banks in the West of England, and under these circumstances the risk of mounting the rail is, of course, very serious".

In another letter at about the same time, Mr Collett remarked, concerning the possibility of the engine *City of Truro* having attained 102.3 mph, "Neither I nor any of my colleagues are able to express any opinion on the matter, as the only information we ever have had are the records made by Mr Rous-Marten which were published some few years ago. The question which is continually being raised as to whether the steam locomotive with reciprocating pistons can really attain a speed of over 100 miles per hour can, I think, be very readily settled by making a trial under plenty of expert observation. We believe in the past that we have many times exceeded this speed, but have never taken any special precautions for making the record, having merely been guided by the ordinary method of using the stop-watch in conjunction with the mile-posts.

"Personally, I do not like these high speed tests . . . The risk with the locomotive is considerably greater than with most other modern types of engines, on account of the difficulty of satisfactorily maintaining lubrication at very high speeds of the valve-gear and driving mechanism, which is entirely unprotected, it being impossible to encase it in an oil bath like other modern machines. Although we have successfully made high speed runs for short periods in the past, we have had very numerous failures in the course of our experiments in that direction, and, as you will know, the failure of oil to any part of the valve-gear leads to the complete smashing up of the mechanism in a very few seconds". Collett was not to know that seven years later Bulleid would have built for the Southern Railway the first locomotives with their motion enclosed in an oil-bath but without ultimate success; nor that his forecast of a serious motion failure due to inadequate lubrication on a high speed run would find fulfilment two years later with the near disaster experienced by the Gresley A4 Pacific *Silver Fox* after the attainment of 113mph in 1936.

"It is only in recent times that we have so improved our lubricating arrangements", Collett's letter continued, "that we are able to run with regularity a high speed service like the 'Cheltenham Flyer', and this, even with the same engines that are doing it to-day, could not have been carried out under the conditions of only a few years ago. Thus we are in a better position now than ever to make a high speed test from a locomotive point of view, and our main concern of recent times has been connected with the track." From this Mr Collett went on once again to stress the matter of superelevation on curves, and what would need to be done in preparation for 100mph speeds. Well, what needed to be done now has been done, and with both safety of operation and comfort to passengers 100mph has become a standard speed over many miles of line in Great Britain.

[The Author gratefully acknowledges the receipt, to November 18, of letters from Richard J. Bourne, S. Cane, A. Davies, F. J. Field, A. J. Foale, J. Gornall, Rev. R. S. Haines, L. C. Holmes, C. R. Moore (2), C. M. Napper, Ronald I. Nelson, C. H. E. Owen, T. Pearson, Colin Starkey, A. F. Smeaton, J. B. Wearmouth, T. S. Williams, and A. S. Wilson-Jones]



Post-war North American steam power

PART THREE

By C. P. ATKINS

THE largest steam locomotives ever built were the American articulated tender engines, of which the most extreme examples scaled over 500 tons with tender in full working order. Alco, Baldwin and Lima, plus the Norfolk & Western Railway at Roanoke, between them built nearly 100 Mallets during the immediate post-war years. To these should be added a further 25 very powerful four-cylinder rigid frame equivalents, all of which together formed a gigantic final gesture in North American super power in the twilight of the steam era.

It is difficult to label a particular class as the largest for it depends what unit is taken as the basis for comparison—the largest is not necessarily the most powerful—and the most powerful on paper may not be so in all conditions. Nevertheless, it is generally regarded that the largest steam locomotives ever were the 24 Union Pacific Big Boy 4-8-8-4s first produced by Alco in 1941. A very close second evolved almost simultaneously by Lima for the Chesapeake & Ohio Railway was the mighty Allegheny 2-6-6-6. Like the Norfolk & Western the C&O's economy was bound up almost entirely with coal; the two concerns between them transported more than 100 million tons of it annually, or about one fifth of the total US output, and roughly equivalent to the total annual US railroad consumption from 1942 to 1946, when railroads were still the largest single consumer. Much of this was worked over single track main lines carrying an exceptionally high traffic density unrivalled anywhere in the world, and furthermore passing through the arduous Allegheny mountain range. Not surprisingly therefore, massive steam power had long been a feature of C&O operation and the new 2-6-6-6s had been designed to haul trains of 160 loaded coal cars weighing 12,000 tons at speeds of up to 45mph; 45 of these giants were built during the war to haul the heavy wartime traffic, while another 15 were ordered from Lima in December 1947 and delivered early in 1949 to permit retirement of some ageing 2-8-8-2s of the 1920s. This final 15 were priced at no less than \$376,000 each (about £94,000 apiece in contemporary British currency), and were probably the most expensive conventional steam locomotives ever built. Because of the rapid dieselisation of the C&O in the early 1950s some of this final series, numbered 1645-1659, enjoyed active lives of barely five years. C&O 2-6-6-6s were last in action, but briefly, during 1956 after a period of storage.

Traditionally noted for colossal steam power, the Virginian Railway, which during the first world war had obtained Baldwin 2-8-8-4 and Alco 2-10-10-2 Mallets, purchased eight C&O type 2-6-6-6s from Lima in 1945. Numbered

900-907, they incorporated a number of modifications subsequently adopted in the final C&O 1949 series; they too enjoyed but brief lives. The VR, except for a short electrified section, although still entirely steam operated in the early 1950s became fully dieselised in 1955.

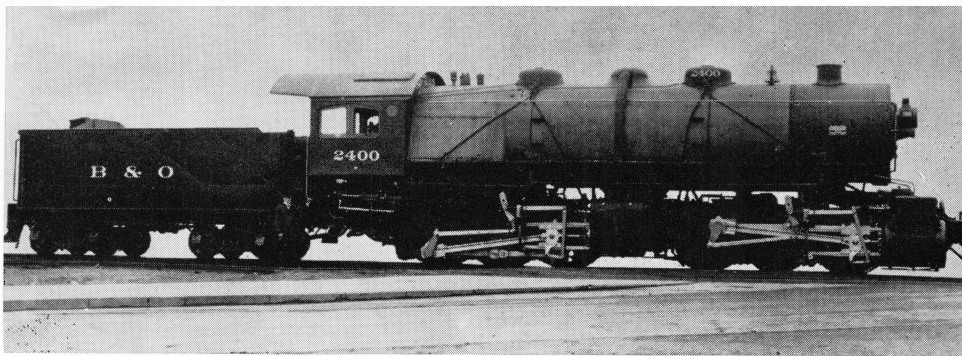
A unique feature of the C&O 2-6-6-6 design was the trailing six-wheel truck. This made for a deep, relatively unrestricted firebox compared with the shallow affair carried over the coupled wheels as in the UP 4-8-8-4. This necessitated the sacrifice of eight-coupled engine units in favour of the six-coupled pattern which was a contributory factor to the record maximum axleload of 96,700lb (38.7 tons)! On test, one of this class developed a maximum of 7,500 dbhp at a speed of 46mph; powers of acceleration were notable, and the boiler was accredited with a sustained output of the order of 8,000ihp. Roller bearings were applied throughout and a double chimney fitted.

The first American Mallet, a compound 0-6-6-0 appeared on the Baltimore & Ohio Railroad in 1904. Effectively the last new American Mallet design appeared on the same railroad just 40 years later,—a simple expansion Yellow-stone 2-8-8-4; 20 of these thoroughly modern machines were built by Baldwin in 1944 followed by another 10 in 1945 to haul the heavy wartime coal trains over the Alleghenies on the Cumberland Division of the railroad. The railroad was already thinking in terms of diesels to do the job, but the US government insisted on steam in order to conserve copper. With a stipulated axleload restriction of 60,000lb these engines were the smallest 2-8-8-4s ever built, if such a term can be applied to a Mallet. Some idea of their size without tender can be gauged from the fact that a 1in scale side-elevation erection drawing in my possession is 11ft long when fully unfolded! These engines had separate blastpipes for each engine unit, the leading axle of each of which had a lateral cushioning device, "Boxpok" wheel centres, and of course the by then virtually standard cast steel bed frames and roller bearings. It was not unknown for three of these giants, the largest on the B&O, to triple head a heavy freight train;—not a sight or sound to be readily forgotten! When new, some of the class acquitted themselves with distinction in heavy mountain passenger service, and monthly mileages just after the war were about 4,000 miles, compared with 2,700 miles for some Baldwin compound Mallets of the early 1920s. Officially the B&O 2-8-8-4s were retired between February 1957 and December 1960, although in fact steam operation ceased on the railroad in February 1958.

Few new compound Mallets were built after the mid-

LEFT: Virginian 2-6-6-6 No 900, one of a batch of eight locomotives bought by the VR from Lima in 1945.

RIGHT: The first American Mallet, a compound 0-6-6-0 built for the B&O in 1904.

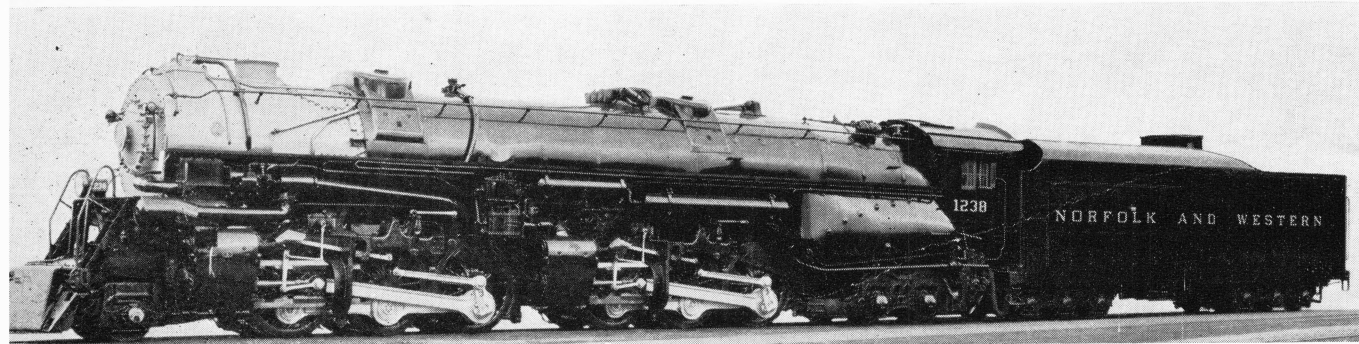


RIGHT: A sight and sound not to be forgotten easily; a triple-headed coal train on the B&O with three of the line's 2-8-8-4 Mallets.

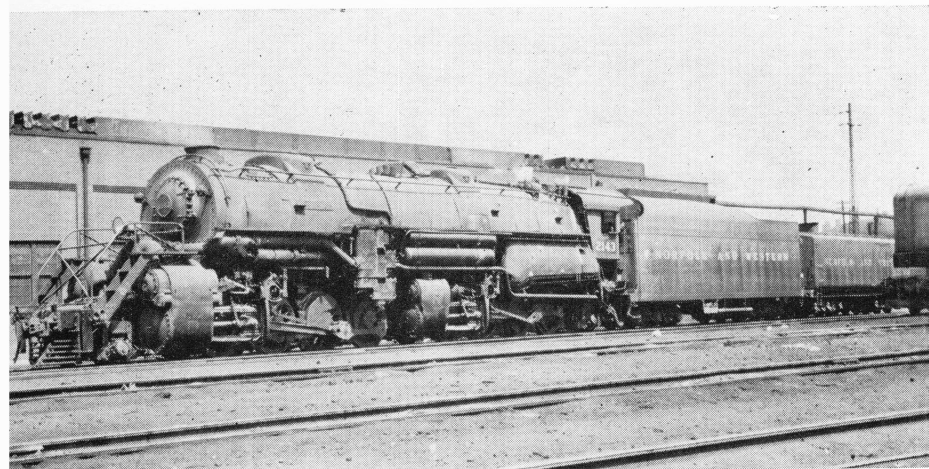


BELOW: Another of the Virginian "Allegheny" 2-6-6-6 Mallets at work on an empty coal train.





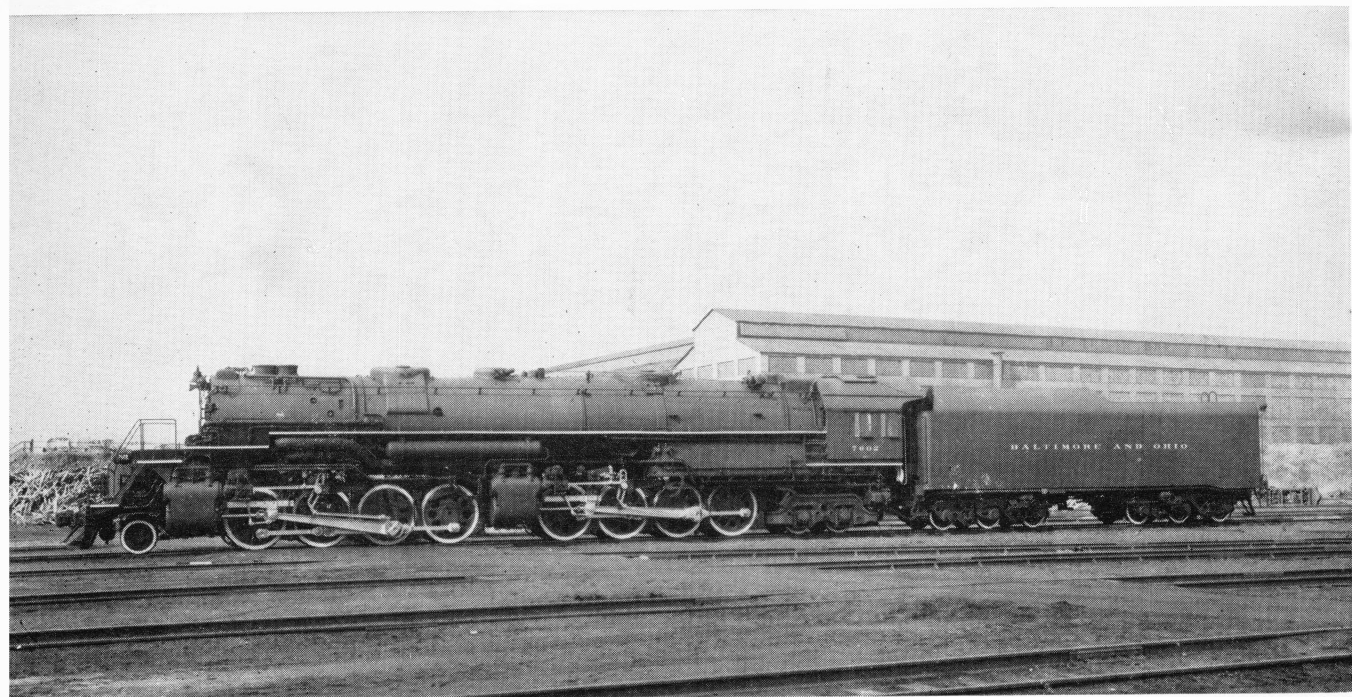
ABOVE: One of the Norfolk & Western high speed 2-6-6-4 Mallets of the final batch of eight, built in 1949/50. They were fitted with roller bearing big ends and crank pins, and, in consequence, had very deep section coupling and connecting rods.



LEFT: Norfolk & Western 2-8-8-2 No 2143. Notice the second tender to allow the locomotive to run further between water-stops.

[Thomas T. Taber]

BELOW: Baltimore & Ohio class EM1 2-8-8-4 No 7602 built by the Baldwin Locomotive Works in 1944/5.



1920s mainly because of mechanical and loading gauge difficulties. It is therefore a somewhat surprising fact that the last domestic steam locomotive to be built commercially in the USA was a compound Mallet as was also the last main line US steam locomotive completed three years later. In the autumn of 1949, Baldwin outshopped 10 relatively small compound 2-6-6-2s for branch line service on the C&O, Nos 1300-1309. The design dated back no less than 30 years, being one of the 12 United States Railway Administration standards of 1919-1920, several of which stood the test of time remarkably well, with repeat orders (with modifications) being received to the end of the steam era. They were perhaps a sad anticlimax to the ingenuity of a great industry; it is believed that one of them has been preserved.

On the Norfolk & Western, compound 2-8-8-2s monopolised the heaviest mountain coal traffic from their introduction in 1918 and the next 40 years. Commencing with the Y2 and ending with the Y6b 30 years later, the compound 2-8-8-2 was progressively developed to a high state of efficiency. The final basis for the design was established in 1930 with the Y5 which had the very high boiler pressure for that time of 300lb in combination with an arrangement whereby the high pressure cut-off was set constantly 5 per cent in advance of the low pressure. The single blastpipe was set forward through an angle of 10deg to clear the superheater header. In 1936 the improved Y6 appeared, in 1942 the Y6a, and after the war the Y6b. An initial 10 were built at Roanoke in 1948 and construction continued steadily until as late as 1952, by which time a total of 30 were in service, numbered 2171-2200. Latterly a number of the earlier Y5s were upgraded to Y6 status bringing the latter to precisely 100 strong which formed the backbone of the Norfolk & Western freight services until 1957, with each unit running about 7,000 miles a month. Had steam continued, even the Y6b would not have represented the ultimate in N&W 2-8-8-2 development. A simple expansion successor, the Y7 was on the drawing board but never built because of dieselisation. Evidently even the N&W considered that the compound had reached the practical limit.

The major swing away from the formerly traditional compounding in favour of simple expansion in Mallets, coupled with major advances in detail design concerning stability, led to the high-speed Mallet in the mid-1930s safely capable of speeds up to 80mph. In 1936 Alco introduced the first of its celebrated Challenger 4-6-6-4s on the Union Pacific (whose Big Boys were essentially a logical enlargement of these engines), and the type was built with fairly wide design variations for several other railroads over the next few years. Among the most handsome Mallets ever built were the 4-6-6-4s of the Delaware & Hudson

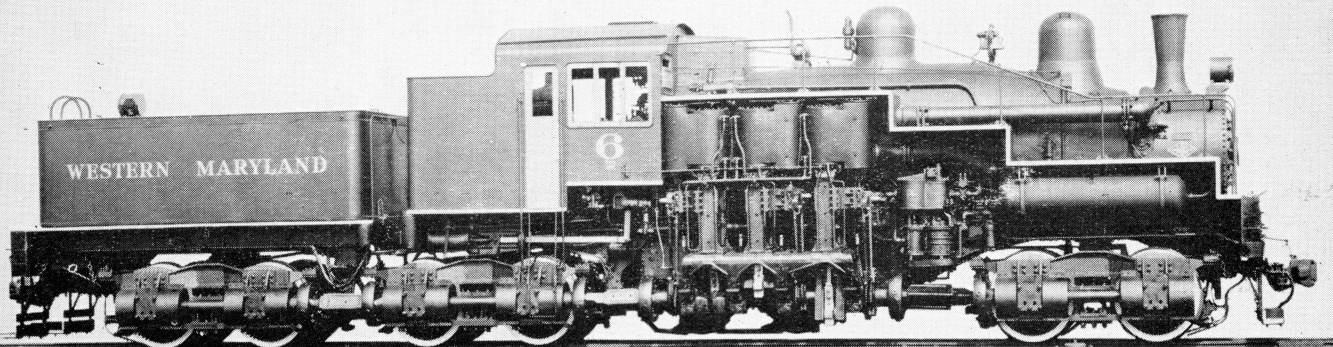
Railroad, of which 35 were delivered by Alco during 1940-2, and to which a slightly heavier final five were added in 1946. These engines had extremely clean lines and chimneys of decidedly Stanier aspect, and great attention was paid to their detail design. The last Alco Challengers were four to the order of the small Clinchfield Railroad outshopped in November 1947, bringing that railroad's quota to eighteen. Whereas the earlier Clinchfield 4-6-6-4s closely resembled the D&H machines just described and had bogie tenders, the last deliveries emulated the Union Pacific variety with double chimneys and rigid-frame centipede tenders. The Clinchfield was completely dieselised in 1954 but its 4-6-6-4s rusted away in store until 1962 before cutting up, the most recent ones having spent a longer period out of use than they had performed in active service!

The Norfolk & Western introduced a 2-6-6-4 high-speed Mallet in 1936. Compared with the Alco 4-6-6-4 design the Roanoke alternative had the benefit of a fairly deep unrestricted grate while the use of only a leading pony truck proved no hindrance to speeds of up to 70mph being attained in normal everyday service. On test a 2-6-6-4 developed a maximum of 6,500dbhp, and the class was generally employed on the flatter portions of the N&W system, around Williamson WVa, and east of Roanoke, sometimes being used in pairs. Heavy passenger trains fell to their lot, and a regular speciality was the coal haul between Williamson and Portsmouth, Ohio; 35 2-6-6-4s were built at Roanoke between 1936 and 1944, to which were added a final eight, Nos 1235-1242, after the war in 1949-1950. A unique feature of the latter series as Mallets was the employment of roller bearing big ends and crank pins, consequently with connecting and coupling rods of very deep section.

In a continent where water troughs were rare (being principally confined to the NYC, PRR and B&O systems) compared with diesels an unfavourable feature of steam locomotive operation was its frequent punctuation by water stops. Some of the largest types could consume the best part of a tender full of water in a single hour (about 20,000 gallons), and from 1953 the N&W supplied its principal Mallets with auxiliary water tenders, thereby roughly doubling their endurance. These were detached from the Y6s when engaged in heavy yard shunting, a duty upon which they excelled on account of their great flexibility and power.

Although it had experimented with a number of extremely large simple-expansion Mallets at about the time of the first world war, the Pennsylvania Railroad never subsequently made any regular use of this type, employing nothing larger than a 2-10-2 for heavy freight duties. As a wartime emergency measure in 1942 it ordered 150 modified C&O-type 2-10-4s from its own shops, but the last 25 were later cancelled and replaced instead by an equal number of very advanced machines of equivalent size to the PRR's own designs. Having already had built prototype four-cylinder

BELOW: Western Maryland Shay 4-4-4 No 6 built by Lima in 1945 but soon made redundant; it was presented to the B&O Transport Museum in 1953.





LEFT: Norfolk & Western class Y6B 2-8-8-2 No 2172 in action on a freight train.

BELOW: Delaware & Hudson 4-6-6-4 Challenger Mallet in action on a coal train. Notice the clean external lines and the British style lipped chimney.



TABLE 5
Table of Maximum Power Output and Boiler Evaporation of Ultimate US, British and French steam locomotive designs

	Max ihp/ Speed mph	Max dbhp/ Speed mph	wt lb/ihp	ihp/sq ft grate	Boiler Max Evaporation steam lb/hr	Coal rate lb/hr	Evaporation per sq ft grate	Firing rate coal per sq ft grate
PRR 4-4-4-4	6,666/100	6,100/75c	75.5	72.4	105,475lb	24,000lb	1,105lb	261lb
NYC 4-8-4	6,997/85	5,375/62	67.3	69.2	112,900lb	18,000lb	1,110lb	178lb
N&W 2-6-6-4		6,500/57			116,000lb		950lb	
C&O 2-6-6-6	7,987/57	7,498/46	77.5	65.7	137,475lb	25,000lb	1,130lb	205lb
PRR 4-4-6-4		4,503/42						
L&N 2-8-4	3,348E	2,511	70.4	67.0	42,000lb	7,160lb	840lb	143lb
LMS 4-6-2	4,200/c. 85		57.4	103.7	48,000lb		1,185lb	
PO 4-8-0*								

E—estimated figure. * French Chapelon 4-cylinder compound design with narrow firebox. c—at cab drawbar.

TABLE 6
Leading Dimensions of Post-War North American Articulated Locomotives

	C&O H6 2-6-6-2	N&W A 2-6-6-4	D&H J95 4-6-6-4	C&O H8 2-6-6-6	N&W Y6b 2-8-8-2	B&O EMI 2-8-8-4	PRR Q2 4-4-6-4½	WM Shay 4-4-4T
Cylinders	2HP 22" × 32" 2LP 35" × 32"	(4) 24" × 30"	(4) 20½" × 32"	(4) 22½" × 33"	2HP 25" × 32" 2LP 39" × 32"	(4) 24" × 32"	(2) 19½" × 28" (2) 23½" × 29"	(3) 17" × 18"
Driving wheel diameter	56"	70"	69"	67"	58"	64"	69"	48"
Boiler Pressure	210lb	300lb	285lb	260lb	300lb	235 lb	300lb	200lb
Evaporative HS sq ft	4825	6639	5389	6795	4915	5298	6725	1849
Superheater	975	2703	1618	2922	1478	2118	2930	401
Grate area	72.2	122.0	108.0	135.2	106.2	117.5	121.7	48.7
Adhesion weight	366,700lb	432,350lb	409,500lb	504,010lb	522,850lb	485,000lb	393,000lb	324,000lb
Engine weight	434,900lb	573,000lb	604,500lb	751,830lb	582,900lb	628,779lb	619,100lb	324,000lb
Tractive effort	98,390lb	114,000lb	115,000lb	110,200lb	152,200lb	115,000lb	100,800lb	59,740lb
	S 77,900lb				C 126,838lb		B 15,000lb	
Coal capacity ¹	16t	30t	25t	25t	30t	25t	37½t	9t
Water capacity ²	12,000	22,000	22,500	25,300	22,000	22,000	19,200	6,000
Tender weight	208,200lb	378,000lb	311,800lb	431,710lb	378,600lb	381,930lb	422,000lb	
Overall length	98' 8½"	121' 9½"	125' 3½"	125' 7½"	114' 10½"	125' 3½"	124' 7½"	66' 0½"

¹ US (Short) tons. ² US gallons. S—Simple expansion working. C—Compound expansion working. B—Booster tractive effort.
 † Pennsylvania four cylinder rigid frame design.

rigid-frame 6-4-4-6, 4-4-4-4 and 4-6-4-4 passenger engines, in 1944 the PRR built in its Juniata shops a striking prototype 4-4-6-4 heavy freight engine. Similar to the 4-4-4-4 passenger locomotives already described, it was appreciably larger; it developed 100,000lb of starting tractive effort without booster and was the most powerful rigid-framed locomotive design ever constructed. The two engine units exhausted through separate blastpipes which discharged through a common chimney of ovoid section. Electrically actuated butterfly valves located in the main steam pipes closed upon the onset of wheel slip and only restored steam supply when the slip had been arrested; 25 production engines followed in 1945.

Locomotive testing facilities in North America were limited and the PRR was the only railroad to possess a stationary locomotive testing plant. As the PRR 4-4-6-4 design was the largest steam locomotive ever quantitatively tested it followed that its outputs of both power and steam were the highest ever actually recorded, although these were almost certainly excelled on occasions by the largest Mallets, particularly the UP 4-8-8-4s, in ordinary service. On the Altoona Test Plant at an equivalent speed of 57mph and at 40 per cent cylinder cut-off, the 4-4-6-4 developed a maximum of practically 8,000ihp at a boiler evaporation of 137,500lb of steam per hour, and a coal rate of 25,000lb. (Some of the largest Mallets could burn up to 40,000lb of coal per hour)

Magnificent in appearance and brilliant in design, the Pennsylvania 4-4-6-4s sadly proved somewhat indifferent in regular operation as did their passenger counterparts, and disappeared at the same time. The more straightforward wartime 2-10-4s were more popular with the operating men, so perhaps traditional Pennsylvania conservatism, if suitably expanded in size, would have proved the better policy after all.

One articulated type largely peculiar to North America, where it was more closely associated with logging camps than railroads, was the Shay geared locomotive. Lima had first entered the locomotive industry back in the 1880s by

building this type and constructed its last in 1945. This was a very advanced superheated three-cylinder 4-4-4 designed specially for service in the Chaffee colliery branch line of the Western Maryland Railway and built at a cost of nearly \$90,000. Here gradients as steep as 1 in 10 and curves as severe as 4 chains had to be negotiated. The highly flexible Shay running on three four-wheel power bogies could haul 5,000 long tons along level track at 10mph. Numbered 6 by its owners it was soon rendered redundant by diesels but was presented to the B&O Transport Museum in 1953.

The giant US Mallet articulateds were the last major steam locomotives in action in North America. The steam era there could truly be said to have ended in 1960 when the remaining Norfolk & Western 2-8-8-2s ceased to operate in May, and the last of the huge Baldwin wartime 2-8-8-4s of the Duluth, Missabe & Iron Range Railway, in Minnesota, dropped its fire for the last time on July 4. Several Mallets have been preserved but regrettably none in working order as far as is known, no doubt on account of the sheer magnitude of the task. None of the largest Mallets actually built exceeded all the others in every respect and on these grounds a 2-10-10-4 having 200sq ft of grate area and developing 200,000lb of tractive effort could (theoretically, at least) have been built within the existing limitations. But the largest 2-8-8-2s, 2-8-8-4s and 4-8-8-4s that actually were built probably represented the realistic limit to mammoth steam power. Some would say these had already exceeded it.

Mallet Locomotive Prices:

2-6-6-2 (1949)	\$208,938 each	(10)
2-6-6-4 (1950)	\$289,772	(8)
2-6-6-6 (1949)	\$376,245	(15)
4-6-6-4 (1946)	\$225,000	"
2-8-8-2 (1949)	\$228,089	(17)
2-8-8-2 (1951)	\$244,524	(7)
2-8-8-2 (1952)	\$269,591	(6)
2-8-8-4 (1945)	\$272,553	(10)
4-4-6-4 (1945)	\$220,000	(25)

[To be continued]



Surbiton power box commissioned

By G. M. KICHENSIDE

THE new Surbiton box commissioned by the SR during last year completes the gap in colour light signalling between Surbiton and Woking on the Waterloo-Bournemouth line.

The first 3yr of Southern Region electric services to Bournemouth were hampered by retention of semaphore signalling and block working with Sykes lock and block equipment between Hampton Court Junction and West Byfleet. This could not be converted to a modern signalling system in the time available before inauguration of the electric service in 1967. The nuisance of this old signalling, with its irregular length block sections was aggravated by a shortage of signalmen so that occasionally one or two signalboxes, particularly Esher and Oatlands, had to be switched out, sometimes even in peak periods. The delays which have occurred in the section since 1967 are mostly traceable to this state of affairs.

It was ended last year by the commissioning of the new power box at Surbiton. Some isolated colour-light signals had been installed prior to the box's opening and these have now been embodied in the main scheme.

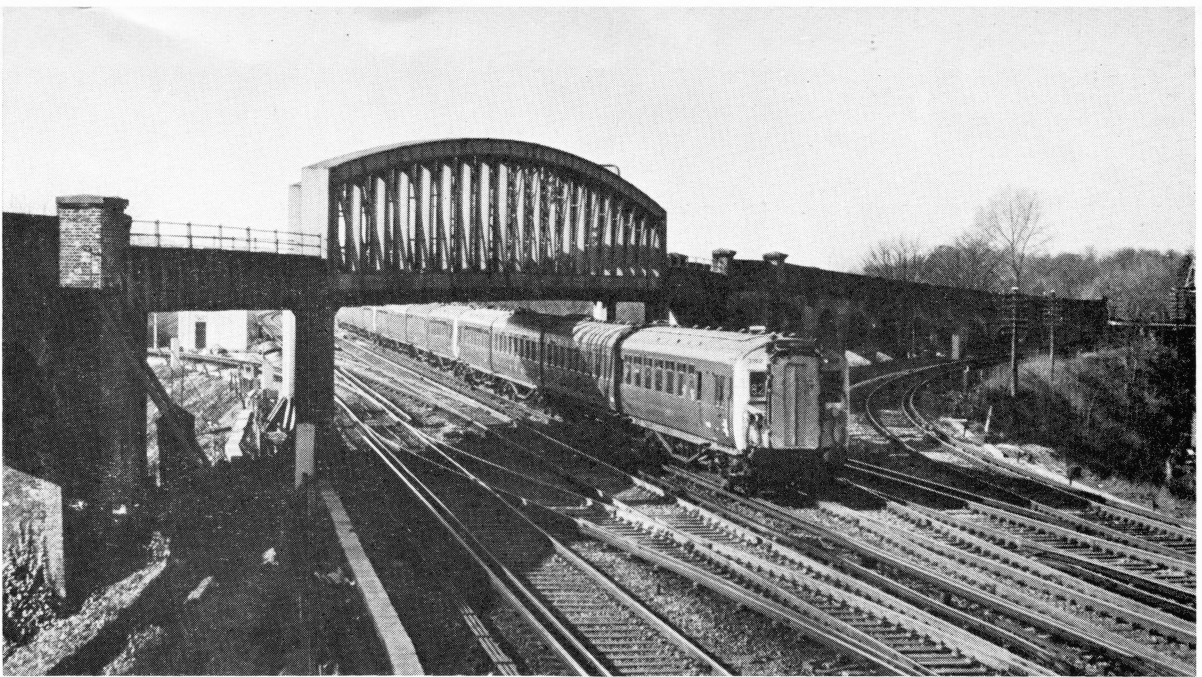
The layout controlled from Surbiton panel centres on the four-track SR South Western Division main line, with lines paired by direction, from just west of New Malden to a point between West Byfleet and Woking. It also takes in the Guildford via Cobham line as far as Cobham, the entire Hampton Court branch and the Weybridge-Virginia Water line (including the triangular junction between Weybridge, Byfleet & New Haw and Addlestone), as far as Addlestone. The fringe boxes are: New Malden towards London; Guildford power box on the Cobham line; Woking on the main line; and eventually Chertsey (until the commissioning of the new Feltham power box in two or three years time) on the Virginia Water line, although at present Addlestone

signalbox remains to control the adjacent level crossing until automatic half-barriers are provided.

In all, nine existing signalboxes have been replaced in the present scheme. During previous years, however, automatic signalling had been installed on the Cobham line in readiness to form part of the Surbiton scheme, and earlier signalling alterations had abolished one of the two boxes at Esher. Similarly, at Hampton Court one signalbox situated by Summer Lane level crossing replaced the former two boxes which previously controlled the station area. Hampton Court box has been retained as a ground frame not only to control the crossing, but also the local carriage sidings, used to stable trains in off-peak periods. Other ground frames have been provided at Cooks crossing on the Cobham line, and at Walton-on-Thames for the up siding; Cox's Lock Mill crossing near Addlestone is supervised by Addlestone box.

Traffic handled by the new Surbiton box is chiefly regular interval electric multiple-unit services. They include the Inter-city services between Waterloo and Portsmouth, Bournemouth and Weymouth, suburban services between Waterloo and Hampton Court, and Guildford via Cobham, and the circuitous Waterloo-Weybridge services via Virginia Water. In addition the main lines carry the semi-fast services between Waterloo and Alton and the stopping trains between Waterloo, Guildford and Portsmouth. Superimposed are the approximately two-hourly diesel locomotive-hauled trains between Waterloo and Exeter.

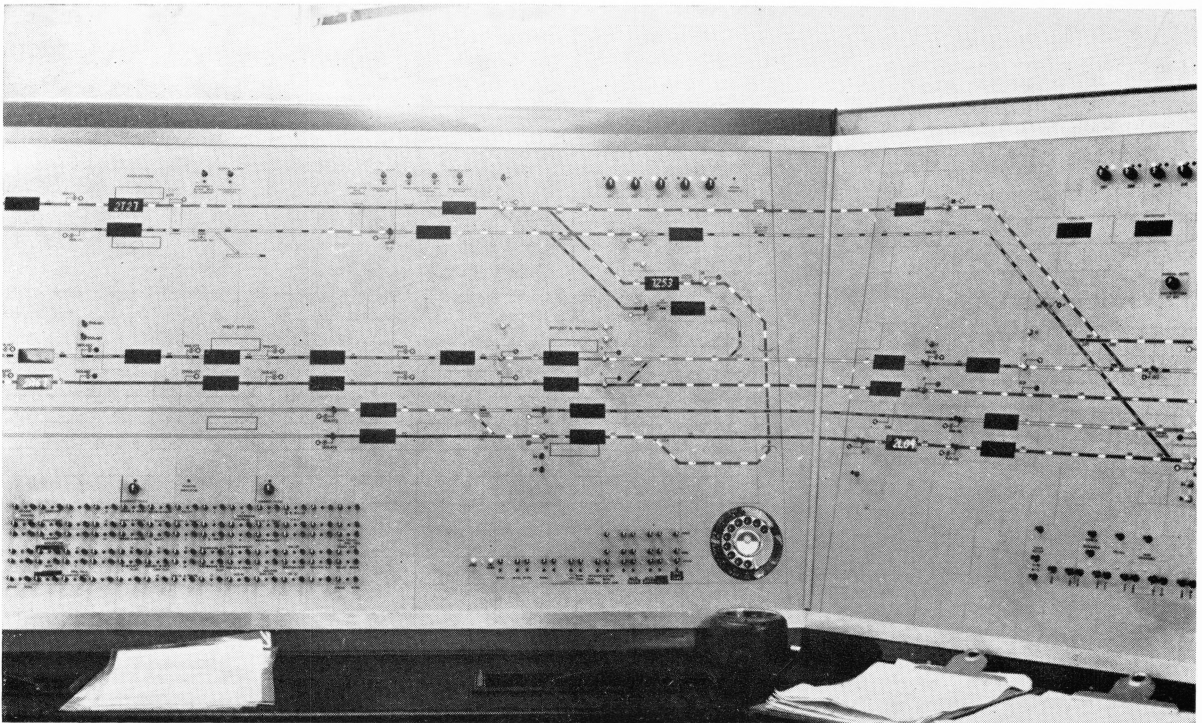
In the peaks, train services are intensive with scheduled headways of no more than 2-3min on the main line. Freight does not feature extensively in the Surbiton control area although some inter-Regional freights from the Eastern and London Midland Regions to Southampton and Portsmouth are routed via the North and West London connections and



LEFT: SR 4SUB unit No 4738 leaves Surbiton on the down slow line bound for Hampton Court in August 1970.
[G. M. Kichenside]

ABOVE: A 12 car train of 4COR units on a Portsmouth-Waterloo working passes under the flyover of the Hampton Court branch at Hampton Court Junction on January 28, 1970.
[Stuart Walton]

BELOW: A close view of part of the new entrance-exit panel at Surbiton box; a route has been set from the down Chertsey line (at the top of the diagram) via the down Byfleet curve to the down slow and across to the down fast. This was for a freight train running from the Staines direction to reach the fast line towards Woking.





Staines to the Virginia Water-Addlestone line, where they take the Byfleet curve to gain the main line through Woking. Parcels trains and the occasional boat train specials to and from Waterloo complete the traffic pattern.

Rationalisation of track facilities has been undertaken as part of the scheme to combine interlocking areas in a minimum number of situations. The Southern was liberal in the provision of main-to-local crossovers and most of the main/local crossing alternatives were available at Surbiton, Hampton Court Junction, Esher and Walton, although surprisingly it was not possible to cross from up main to up local at Surbiton. Down main to down local and up local to up main crossovers were also provided at Oatlands.

Full crossing facilities are now restricted to Surbiton and (except for up fast to up slow) at Hampton Court Junction (the designations of track use on the Southern now conform with the BR standard nomenclature). All crossing facilities have been removed from Esher and Oatlands and the latter's crossovers transferred to Weybridge, while at Walton only down slow to fast and up fast to slow are provided. A new crossover has been installed at Byfleet and New Haw to replace that at West Byfleet from down slow to down fast so as to give freight trains from the Virginia Water direction running via the Byfleet curve, an opportunity to reach the down fast earlier.

Four-aspect signals are employed generally on the main lines and three or two-aspect, as appropriate, on the branches, where the headway is longer than on the main line. To allow following stopping trains to close up during station stops, additional home signals have been installed at the approaches to stations on the up and down slow lines. To avoid any possibility of a driver misreading signals, the additional slow line signals have been matched by similar signals for the fast line, but the latter have no stop aspect, and thus act as intermediate distant signals showing yellow, double yellow or green. Where signals are spaced close together in this fashion, braking distance from green to red is spaced over four signals instead of the normal three.

Surbiton box structure itself is prefabricated on unit construction principles and is similar to the boxes at Basingstoke and Eastleigh. It is equipped with a Westinghouse domino-type combined control and indication panel, which for the first time in recent years is of the almost vertical pattern by comparison with the nearly horizontal consoles used elsewhere on the SR. The panel is designed so that it can be unplugged and linked to the control panel of the

ABOVE: Another view of Hampton Court Junction, this time on February 28, 1970 with Warship Type 4 No D811 heading a Waterloo-Exeter train about to pass Brush Type 4 No D1592 with a coal train from Severn Tunnel Junction. [Stuart Walton

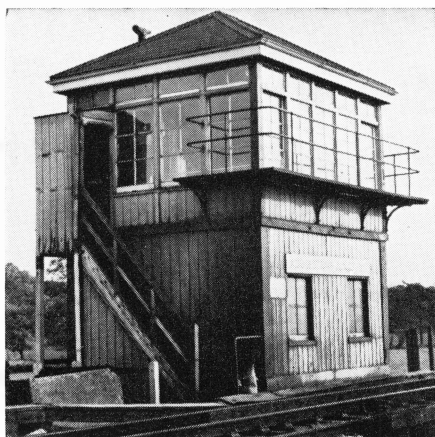
proposed new Waterloo power box to be built during the next few years.

Surbiton panel is equipped with the standard double-push route-setting buttons, but with individual point switches for use when manual control is needed in exceptional circumstances—for example, if the route button fails to establish a route correctly or for setting overlaps; at Surbiton, for example, point switches are used to set alternative swinging overlaps ahead of the down platform starting signals. An additional route exit button is provided on the down slow and down loop lines in conjunction with a short 50yd overlap which provides delayed clearance of the down home signals approaching the station.

The Surbiton panel embodies a number of modifications from recent SR panels, other than the upright design itself; the back is made of fibreglass and particular attention has been given to heat dissipation from the many indication lights by circulating cooling air through the panel. On the panel, standard in-line cathode-ray describers display the BR standard four-character train description code. Although SR trains carry a two-figure routeing code, in the working timetable each train is also given a four-character code, which is employed as the train's reporting number for signalling purposes.

For the first time on the Southern, a small general-purpose computer has been employed in the train describer system.

Normally the signalbox is manned by two signalmen and a booking lad. There is no traffic regulator, but the station manager or his deputy usually supervises the peak services. Surbiton control area is not one of the largest on the SR and controls only 19 route miles and 67½ track miles, but the intention ultimately is to include it in the control area of the planned Waterloo box.



TOP: A general view of the old box at Walton-on-Thames together with the inner home signals, and an up stopping train approaching in the distance. Since this photograph was taken the layout has been rationalised, the semaphore signals removed and the signal box demolished.

[J. Scraze

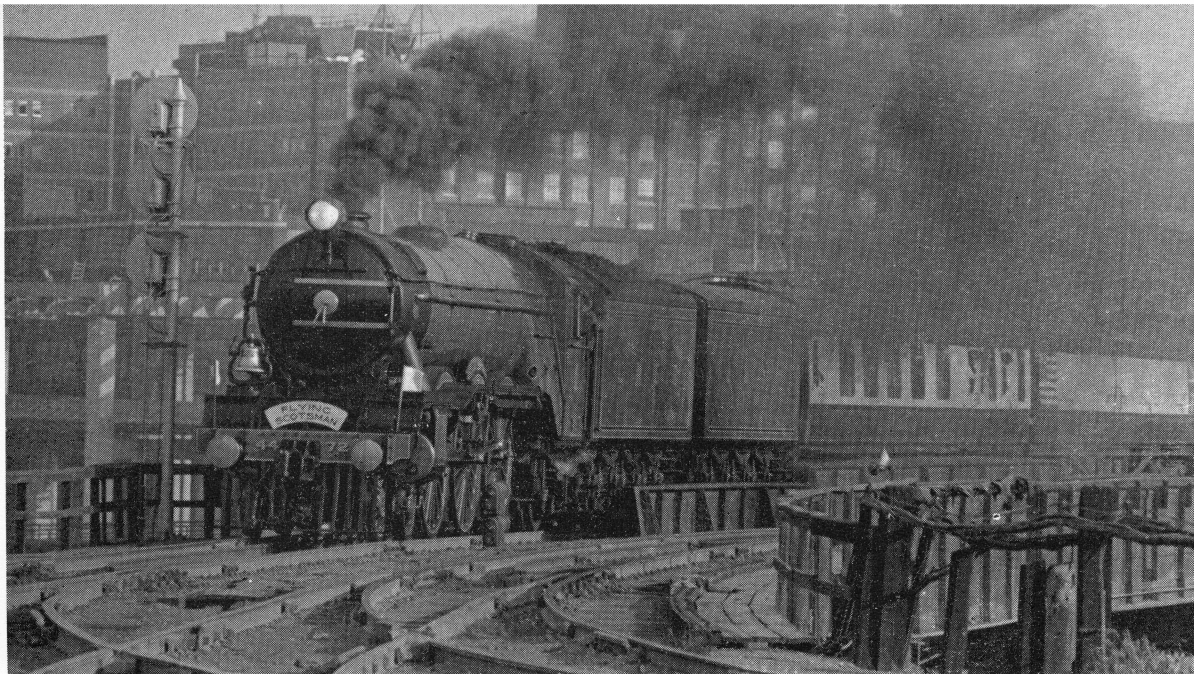
CENTRE: Two more boxes made redundant by the new Surbiton panel; on the left Addlestone Junction and, right, Byleet Junction.

[J. Scraze

RIGHT: Two 2EPB units leaves Weybridge towards Chertsey on the 16.33 service to Waterloo via Staines on May 15, 1969. The working of these trains in and out of Weybridge can now be set for automatic operation from the Surbiton panel.

[J. Scraze





On tour with Flying Scotsman

By **ROBIN RUSSELL**

PHOTOGRAPHS BY THE AUTHOR

"**A**PPlicants will find the tour strenuous but exhilarating, tiring but unforgettable." These words, prophetic as they proved to be, concluded the write-up describing working holidays with the Flying Scotsman train. I had travelled many, many miles to see 4472 when I lived in England. In 1969, by then domiciled in Toronto, I made my pilgrimage to Massachusetts to see the start of the 1969 tour. Clearly, an opportunity to participate in the 1970 trip was not to be missed. Conflicting and uncertain personal and business arrangements, together with postal strikes in Canada, made for some anxious moments; however, the arrangements were eventually completed.

The skyline of Kansas City, Missouri, came into view as the overnight train neared the end of its run on Saturday, June 27. No 4472 was on show at Union Station and I believe that my train used to arrive there. However, perhaps as an admonishment for their stubbornness in preferring to travel by rail in the year 1970, passengers are now dumped in the outer suburbs, an infuriating £1 0s 0d taxi fare from Union.

Innocently thinking that this might be the only sunny day, I sneaked a quick photograph of engine and train before reporting for duty. I immediately had the pleasure of meeting George and Frances Hinchcliffe, who had provided me with willing assistance on my many queries since George became head of Flying Scotsman Enterprises. Pleasantries did not last long, however. The public were soon due on board and much had yet to be done; within minutes I was busy on odd jobs.

The procedure was for visitors to buy their tickets near the observation car and walk down to the engine, visit the footplate and then return through the train. Exhibits included stamps, a model railway, a movie show, replicas of the Crown jewels and displays depicting the English way

of life. Exhibition hours were 10-8 daily, so we worked 9-3 one day, followed by 3-9 the next. Tasks included ticket seller, ticket collector, footplate guide, souvenir seller and bar assistant. I had placed so much emphasis when completing my application form on locomotive duties, that engine cleaning was made my sole job (except for relief duties). Previously, work on the engine had been done on an ad hoc basis by the crew normally employed on more elegant jobs.

Before Saturday had got much older I began to show the effects of the heat by commencing my record consumption of iced ginger ale. That evening I ate in town with three of our American members. Discussion turned to the different terms used in the States. These included engineer (driver), throttle (regulator), ties (sleepers), switches (points), switcher (shunting engine), track pans (water troughs), wye (triangle), pilot (cowcatcher) and the practice of measuring gradients in per cent.

Sunday came, again without a cloud in the sky. Unaware that we would soon be under a station roof at St Louis, one of the Americans and I set to work on the upper boiler and dome. We worked through our free shift, just about fried ourselves on the hot metal, and earned a word of praise from Chief Locomotive Inspector L. Richards. On May 4 day 1968 it was Les Richards, of York, who made possible the non-stop run with his crucial decision to press on towards Edinburgh with a dwindling supply of water. Now he was over in the States with responsibility for engine and crew. With him were Fitter Harry Mason (Doncaster), Drivers Nat Gould, Arthur Houghton and Gordon Pugh (all of Doncaster), Firemen Bill Brand (Haymarket) and Alan Wappat (Tyne Yard).

That night we sampled American hospitality. As in any other country, the States have their lunatic fringe (evidenced,



ABOVE: Privately-preserved LNER class A3 Pacific No 4472 *Flying Scotsman* with its tour train, seen in action on its 1970 trip.

LEFT: *Flying Scotsman* winds its way slowly out of St Louis on the morning of July 7 at the start of its journey to Chicago via Decatur.

for example, by a bullet mark on one of the tenders!). However, all I encountered was interest and kindness. We travelled out to a delightful house and grounds in the Kansas suburbs for a dessert party. The food was superb and we were made really welcome; to my eternal shame I do not recall the name of our hosts. After the party I returned to the train and took a series of night photos, including a spectacular shot of "4472 in LMS livery" where the illumination was provided by the powerful red light on the rear of a departing train.

Monday was hotter still, although I had now learned to follow the sun around the engine so I was always working in shadow. That evening engine and train were towed round the wye ready to start off in the correct direction the following morning. In the observation car Peter Boht was in charge of the bar, fitted out (most nostalgically for me) as a London pub; the name, *The Fireman's Rest*, was very appropriate. It was here that the local Rugger club threw a party, where I met Gerard Seymour. He proved to have played Rugger for our arch-opponents Esher during my time with the Old Whitgiftians. Now eminent in Kansas City business circles, he was only a few short of having seen every BR steam locomotive when he moved to the States. Alas, this is no longer very difficult.

Early Tuesday morning we pulled out en route to St Louis and before long were up to our maximum of 50mph. Suddenly, we came to a dead stand in the middle of the country. Horrors! Middle big end? Fusible Plug? It turned out that the heat from the fire had activated a lineside hot box detector, bringing to red the appropriate signal. Before long we were under way again, but were stopped several further times before arriving at our whistle stop in the town of Mexico shortly before midday. I spent nearly three hours explaining the cab layout to visitors. With the

engine in steam and the mercury up in the nineties outside, I needn't describe how I felt. The engine, too, was affected by the heat, having arrived with the left hand front bogie axlebox short of oil and decidedly warm; however, no more trouble was experienced in this quarter.

Soon after leaving Mexico came what was perhaps the highlight of my entire trip. Clutching a footplate pass and my camera I groped my way through the two corridor tenders and emerged onto the engine. Here the scene was hot, bumpy and somewhat crowded (Inspector, Driver, Fireman, Pilotman and myself). Above all, it was a most enthralling experience. There was no trouble maintaining our 50mph limit on this fairly easy road. The regulator was generally well open and Gordon Pugh made frequent changes of cut-off. Alan Wappat told me afterwards (it was too noisy for general conversation at the time) that the coal was dirty but free steaming.

Just after dark we arrived at St Louis, where we had to reverse into the station. A severe bend on a grade, together with a speed limit which precluded any prior momentum, made necessary a helping push from a pilot locomotive. The evening was not over for engine and crew, as coaling took place that night (our coal travelled ahead by freight train). I, meanwhile, had retired to bed after a truly memorable day.

Although our train stood in the shadow of the station roof the temperature and, even worse, the humidity had risen higher than ever. This caused a noticeable reduction in visitors and hardly improved working conditions. At Kansas only the sidesheeting on the tenders, cab and firebox could really be called immaculate. But now *Flying Scotsman* really began to shine; Les Richard's eagle eye picked out areas he deemed unclean, which were duly attended to. Some were subtle details. Others were not, such as the main frame inside the driving wheels! I decided to anticipate his likely next move and had a day on brasswork. Richard (the Hinchcliffe's young son, one of the personalities of the tour) started on the oil boxes while I set to on safety valves and whistle. I later heard that when the train reached Green Bay and the staff were kept exceedingly busy on museum duties, the return of the safety valves to their earlier dullness caused official displeasure. This in turn, I understand, led to my being cursed for ever having meddled with them in the first place. C'est la vie! On Thursday evening 4472 was towed away for ash removal, inspection and boiler washout. This was all most interesting. I had



ON BOARD 4472

ABOVE: A night shot of *Flying Scotsman* and its train parked at Union Station, St Louis, last July.

LEFT: A cab view of the road ahead between Mexico and St Louis on June 30; No 4472 was travelling at the stipulated maximum of 50mph.

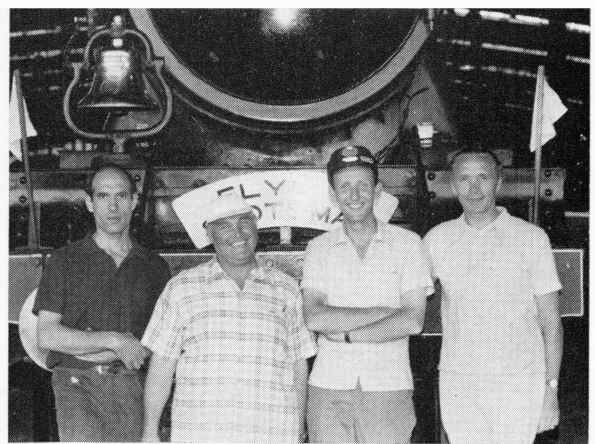
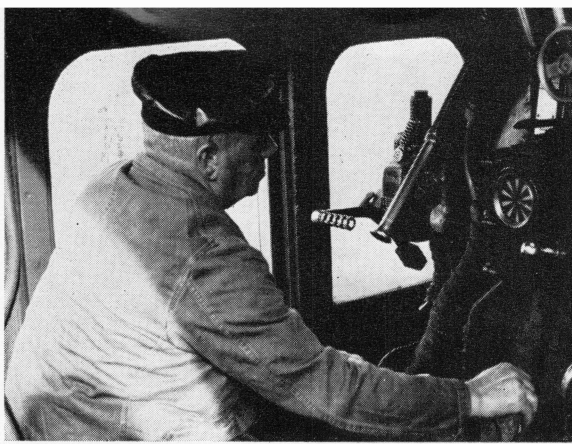


RIGHT: Personalities on the *Flying Scotsman* tour of the USA during summer 1970. Top Left, Driver Pugh in action on the run between Mexico and St Louis on June 30; Top Right, an off-duty group at St Louis with the Author, Driver Gould and Firemen Wappat and Brand; Bottom Left, is Inspector Richards with Driver Pugh looking forward out of the cab; and Bottom Right, Driver Houghton builds up the fire early on the morning of July 7 before the run to Chicago.

not previously realised that access to two of the washout plugs had to be made through the smokebox.

Saturday was the Fourth of July, celebrations being marred for some by a ban on fireworks. Our shift enjoyed a free trip down the Mississippi on the river boat *Admiral* (the others went the following day); the Captain gave us VIP treatment including a tour of the engine rooms. Saturday also brought cooler weather and with it crowds of visitors.

In the evening a party for the crew was held in the train by Ron Hawkes and Nick Lord. Both keen railway enthusiasts from England, they were responsible to George



Hinchcliffe for the day-to-day running of the train. I found them to be most knowledgeable and helpful.

I was one of the Black Pilot Gang! We approached Mr Pegler with the suggestion that the red paint of the cowcatcher drew too much attention to this device. He agreed to permit a trial repaint in black, which was carried out on Sunday; I found the change a decided improvement. Also on Sunday, I visited the National Museum of Transport. Here I was introduced to Dr J. Roberts, head of the Museum. He detailed the main exhibits, which included a 4-8-8-4 "Big Boy". One should never miss the chance of seeing such impressive machinery, although I did pause to think how lucky the Old Country is in having groups of enthusiasts carefully maintaining so many of its preserved steam locomotives.

It was at St Louis that one of the station staff took great delight in recalling a wartime story: a group of GI's at a London terminus just before D-Day had been ridiculing the small size of one of the pilot locomotives. The driver was asked "Do you know what we'd do with an engine like that back in the States?" The gist of his reply, which left them speechless, was "From what I've heard of you people, you'd either make love to it or drink it."

Monday passed quickly. Shortly before midnight the fire was lit in preparation for the next day's run. The choice of three drivers and two firemen meant that on days with two firing shifts it was a driver who prepared the engine the previous night. So when I appeared at the engine at 5.0am for some early morning photographs, it was Arthur Houghton who was tending the fire. A couple of hours later and the train departed. I, however, was not on it for I had been given the opportunity of travelling the route by car; yet another kindness from an American enthusiast. We reached a stretch where the road ran parallel to the railway and I obtained some broadside shots of 4472 at speed.

We arrived at Decatur just after the train. Armed with a tin of metal cleaner I quickly wiped over the engine's

brasswork, especially on the left hand side where there always seemed to be a greater accumulation of soot; perhaps the prevailing wind blew the exhaust in that direction. The engine crew were pulling forward the coal, which was next given one of its frequent washes in an attempt to keep down the dust.

I then had a short spell of duty on the footplate; it wasn't quite as hot as at Mexico. This job involves letting innumerable infants ring the engine's bell, keeping people away from anything that is too hot to touch, and answering questions. These varied from "Where is the steering wheel?" (I dare not offend my lady friends by saying whether a man or a woman came up with that one!) and "Is the track gauge the same?" to puzzlement over the whereabouts of the third cylinder and the absence of air brakes and a mechanical stoker.

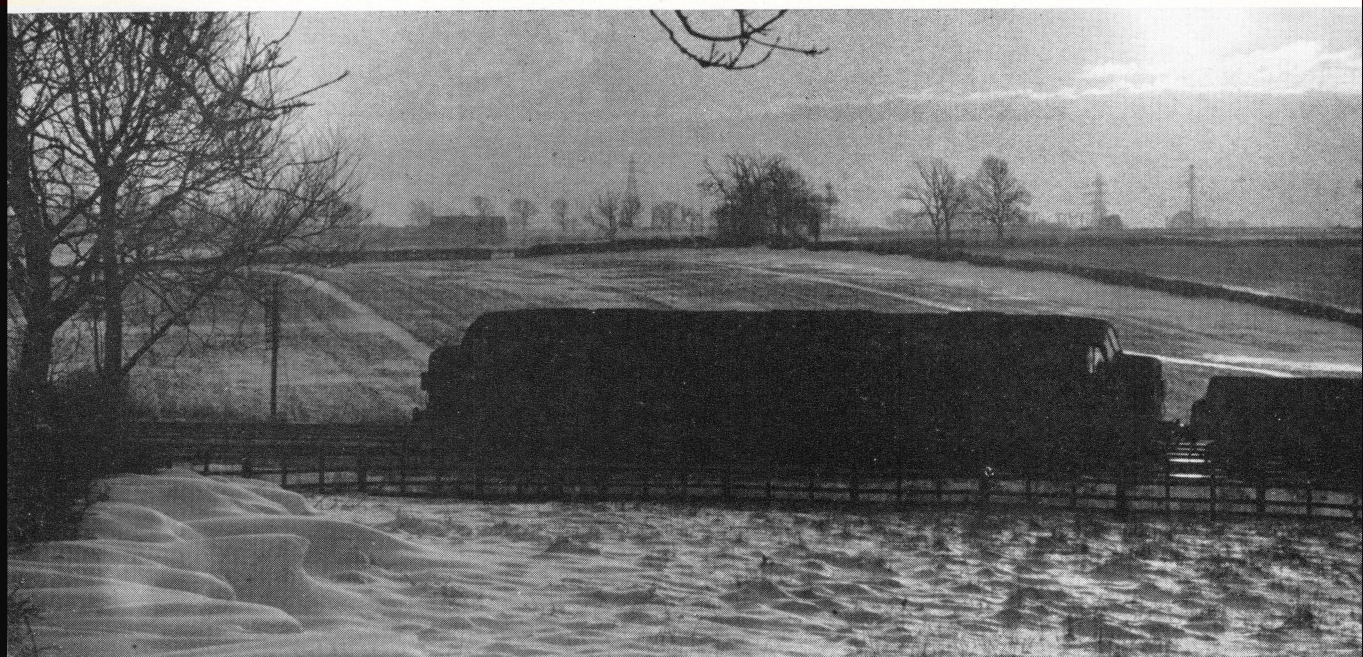
Leaving Decatur by car, we photographed the train a few miles to the east. *Scotsman* was working really hard this time and my mind went back to the good old days with the Pacifics and V2's pounding up the bank through Hadley Wood.

On to Dearborn Station, Chicago, where the train had arrived and many TV cameras were in attendance. I made my final trip with the locomotive as it went to drop the fire. No pit, straight onto the ties! The day was nearly over, time to share out the remains of the iced water. This was stored in an insulated container on the tender front and kept surprisingly cold; it must have proved very welcome to the crews in the weather of the past weeks. Later in the evening I spent a quick hour on 4472's brasswork and then turned in for an early night before my journey the following day.

On Wednesday morning I boarded the "Maple Leaf" express to Toronto, and caught a glimpse of 4472 as we pulled out of the station. Opening my book, I read the words, "...Alan Pegler, in buying Flying Scotsman and restoring it...won the thanks of millions..."; I am one of the millions.



Snow and steam





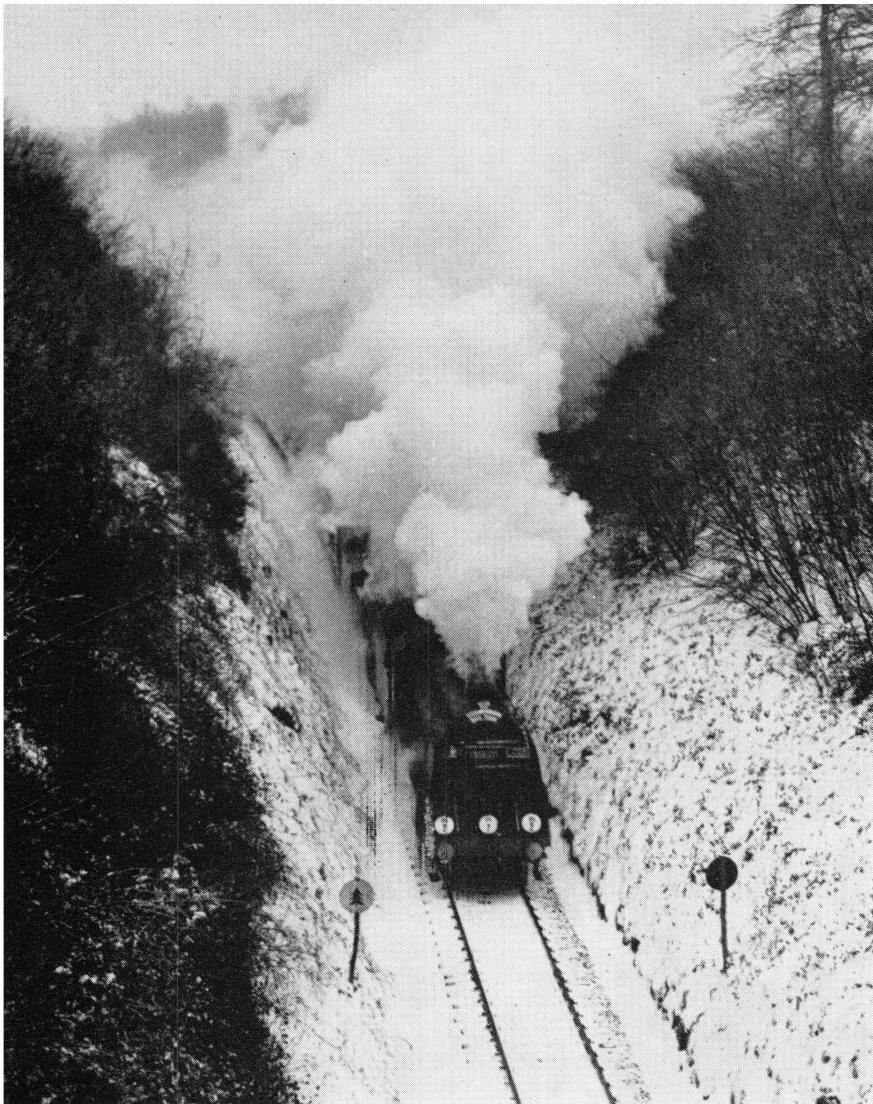
FACING PAGE TOP: The late afternoon sun catches Class 4 4-6-0 No 75030 as it banks a freight on the climb to Shap on December 9, 1967. [A. Stewart]

FACING PAGE LOWER: BR/Sulzer Type 4 No 76 drifts past snow covered fields at Kibworth with an up coal train on January 10, 1968. [J. H. Cooper-Smith]

LEFT: Stanier Class 8 2-8-0 No 48442 heads a Gow-hole-Buxton freight at Chinley South Junction on February 3, 1968. [D. Huntriss]

BELOW: Coversation piece at Yeovil Town depot on December 28, 1964. [M. J. Fox]





LEFT: SR Class S15 No 30837 and class U 2-6-0 No 31639 battle up the climb to Medstead on the Alton-Winchester line with the LCGB S15 commemorative tour on January 16, 1966. [R. Fisher]

RIGHT: A BR/Sulzer Type 4 heads the down "Thames Clyde" express near Ais Gill on February 20, 1970. [D. E. Canning]

SNOW AND STEAM

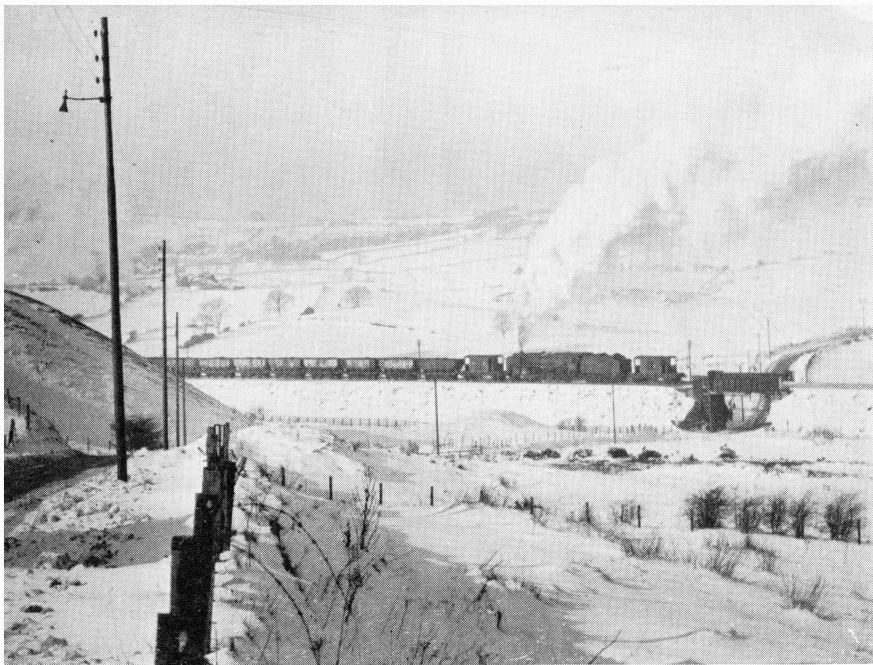
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LEFT: Brush Type 4 No 1651 heads the 10.35 Paignton to Paddington through a blizzard at Midgham on February 11 1970. [D. E. Canning]

RIGHT: Royal Scot class 4-6-0 No 46127 *Old Contemptibles* heads the 14.25 St Pancras-Manchester through Kegworth on March 8, 1958. [M. Mitchell]

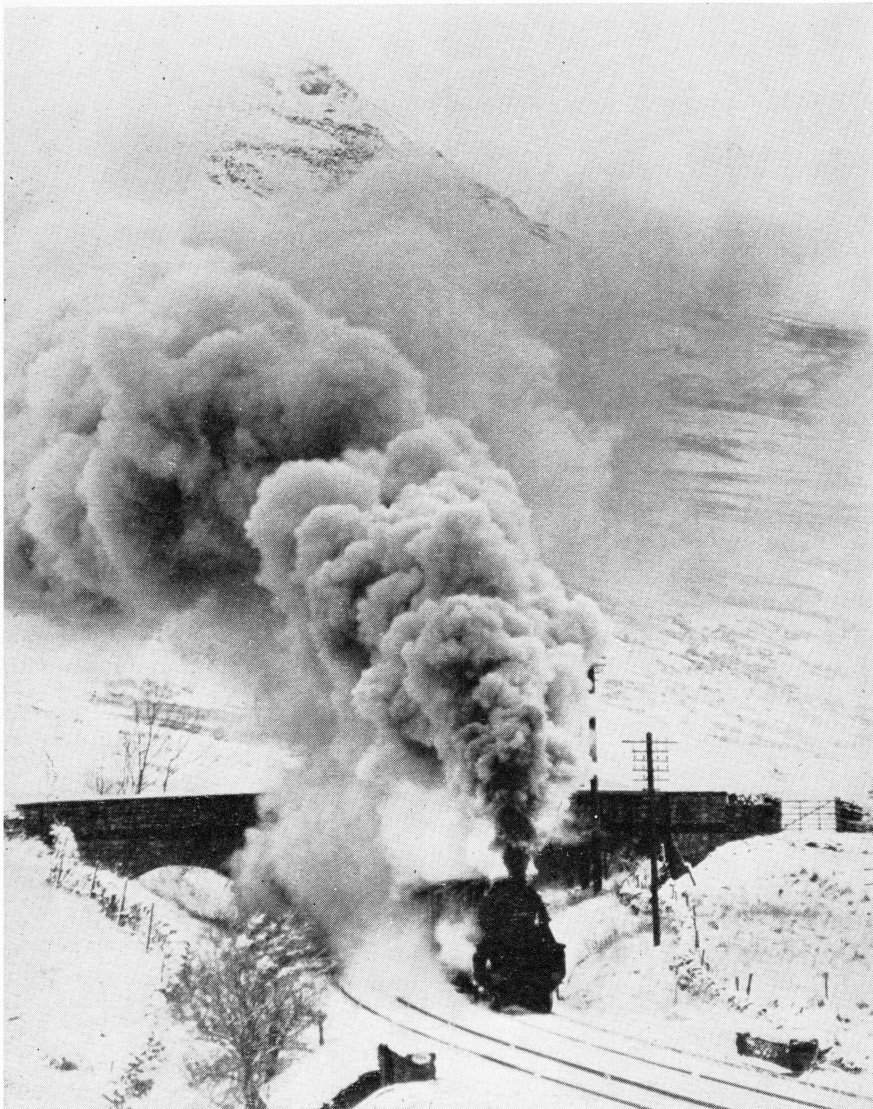




LEFT: A Class 9 2-10-0 banks a coal train for Consett between Stanley and Annfield Plain on February 24, 1966. [Verdun Wake

RIGHT: Class J27 0-6-0 No 65817 thunders over the level crossing at Pontop Crossing with the Tyne Dock-Consett line with a coal train on the Sunderland-Gateshead line on March 6, 1966

[M. Dunnett

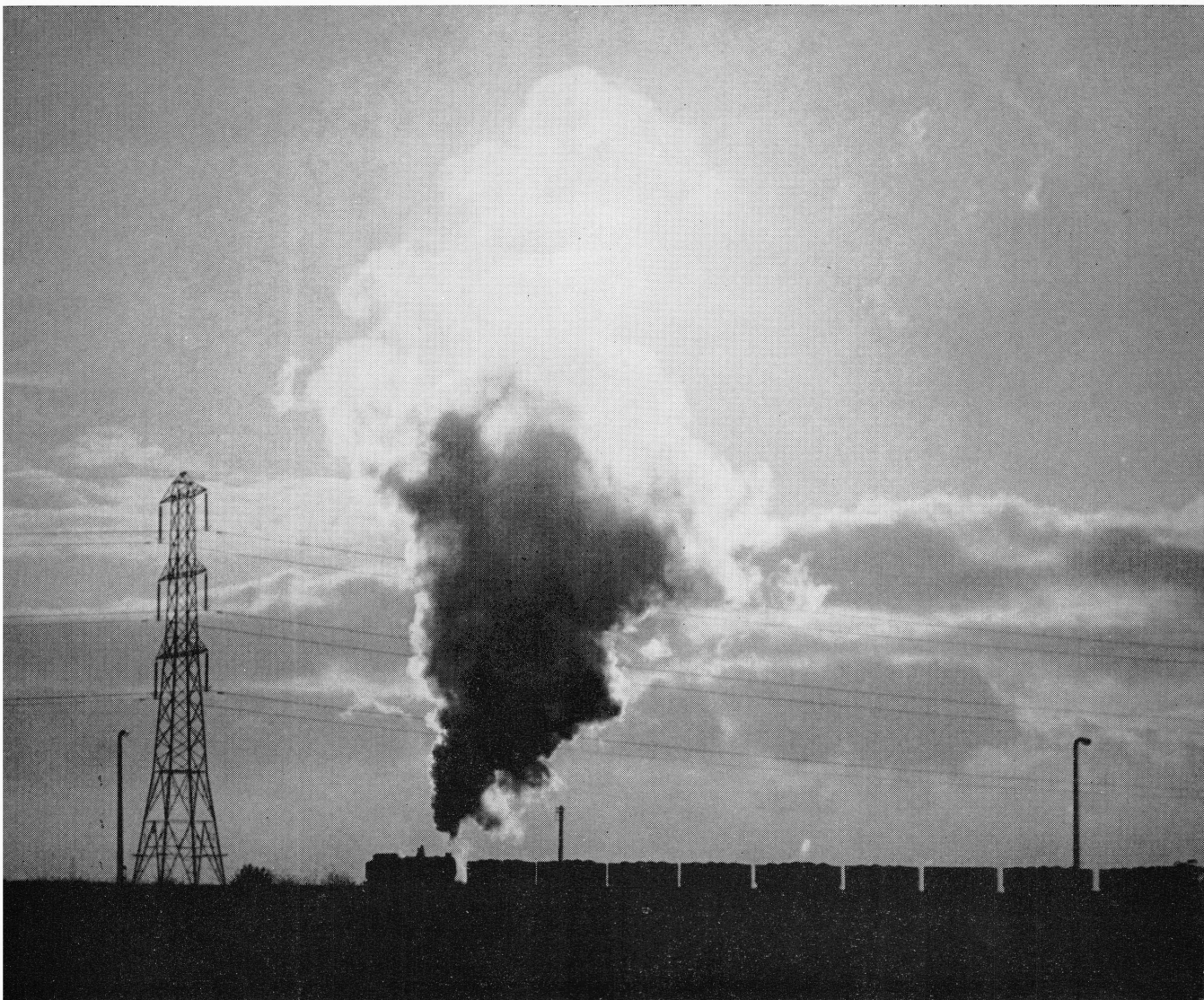
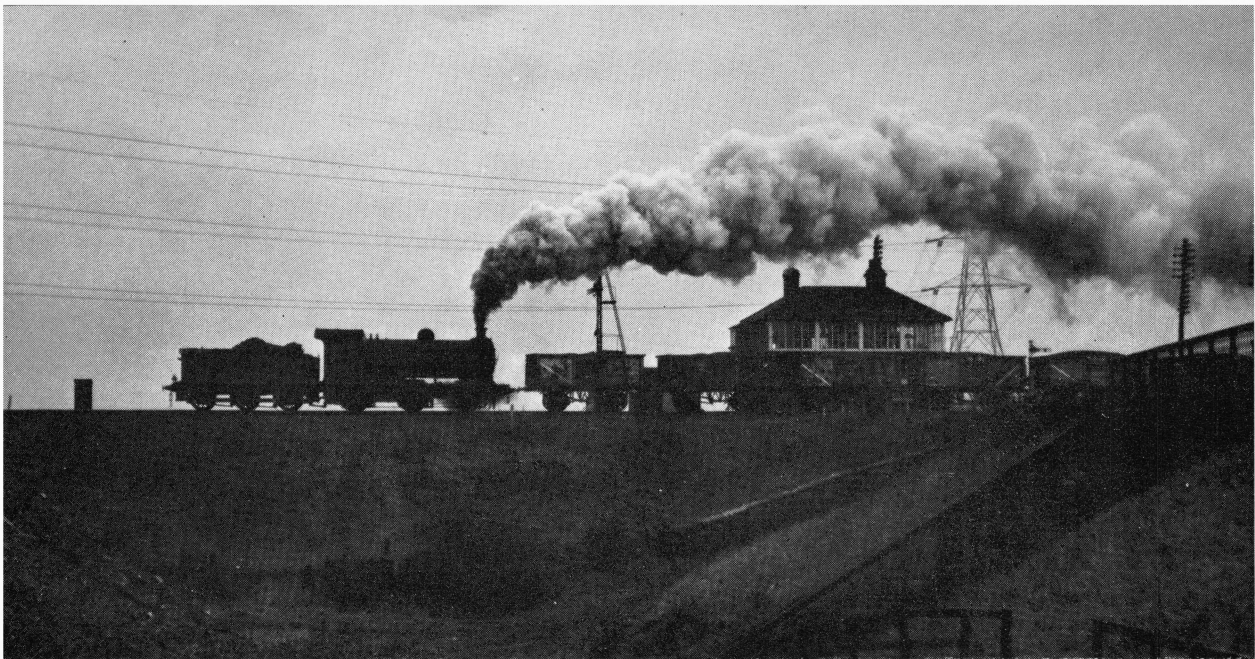


SNOW AND STEAM

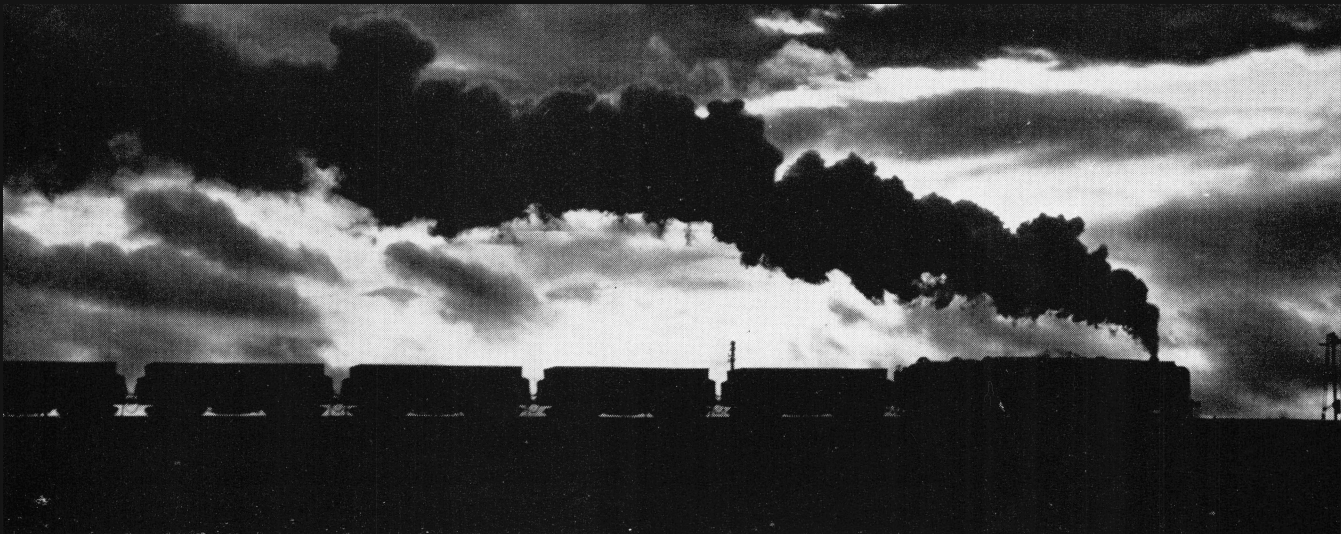
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LEFT: Stanier Class 5 4-6-0 No 45426 storms its way towards Ais Gill summit beneath Wild Boar Fell with the 05.30 Carlisle-Tinsley freight on December 24, 1966. [Maurice S. Burns

RIGHT: An NCB 0-6-0ST climbs away from Backworth on the NCB line to Percy Main. [John R. P. Hunt







SNOW AND STEAM

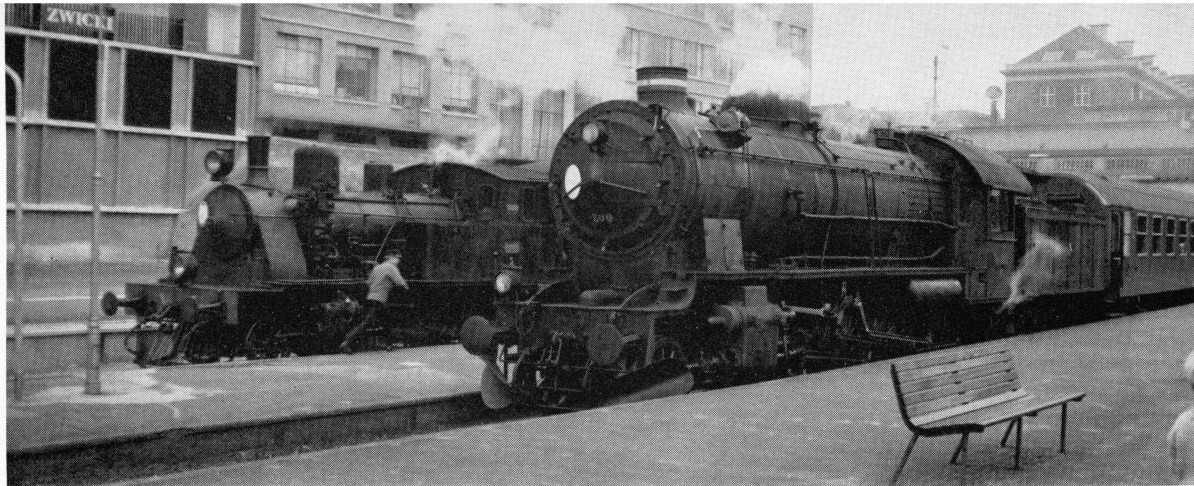
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ABOVE: A Class 9 2-10-0 climbs towards Pelton with a Tyne Dock-Consett ore train on January 1, 1966. [M. Dunnett

LEFT: Class J27 0-6-0 No 65872 slips while trying to keep a coal train on the move travelling *down* Seaton bank for Sunderland on October 29, 1966. [Paul Riley

BELOW: Class 9 2-10-0 No 92099 blacks out the countryside between South Pelaw and Pelton on April 14, 1966. [M. Dunnett





The end of steam in Denmark

By J. M. TOLSON

PHOTOGRAPHS BY THE AUTHOR

THE summer of 1970 marked the end of 123 years of steam traction on the Danish State Railways (Danske Statsbaner or DSB) although it must be admitted that despite the existence of a large number of locomotives, steam activity on the system had been minimal for several years. The first line in Denmark, between Copenhagen and Roskilde, was opened on June 27, 1847, and the engine used for the opening, *Odin*, was one of five 2-2-2s built for the Zealand Railway in 1846 by Sharp & Co of Manchester. The physical peculiarity of Denmark, which consists of the mainland section, Jutland, and the four large islands of Zealand, Funen, Lolland and Falster, led to the fragmentary development of the railways and, although the Zealand Railway extended its line from Roskilde to Kørsor in 1856, the first line on Jutland was not opened until 1862, to be followed three years later on Funen by the line between Nyborg and Middelfart. Although operated by a private company, the line was state-owned and in 1880 the Zealand Railways were taken over by the State while the final fusion of the State Railways in Jutland-Funen and the State Railways of Zealand took place on October 1, 1892, when the celebrated Otto Busse, who had been Chief Engineer of the former system, assumed the complete control as CME, a position he was to hold until 1910. Nevertheless, the still unbridged Great Belt has necessitated the operation of the DSB as two virtually separate systems with headquarters and workshops at Aarhus and Copenhagen respectively. Moreover, despite this early nationalisation, private companies proliferated and even today there are some 15 still in operation accounting for about 25 per cent of the total railway route mileage, but these lie outside the scope of this brief survey.

Denmark is a largely flat country with fine agricultural land producing dairy products, bacon and vegetables, with a growing industrial element contributing to making it self-supporting in many ways. The relatively short distances between main centres, as in Holland but with the added obstacles of ferries across the straits, did not justify the construction of exceptionally powerful locomotives but gave rise to some interesting designs. After the Sharp singles of 1846 and the Cramptons of 1856-7, which reputedly covered the 69 miles between Copenhagen and Kørsor in 2hr 35min with numerous stops, a large number of 0-4-2s and 2-4-0s were supplied, mainly by German builders, with the first 4-4-0s appearing in 1882 and 4-4-2s in 1907, al-

though Pacific locomotives did not run in Denmark until 30 years later when some were obtained from Sweden. Despite the electrification at 1,500V dc of certain lines in the Copenhagen area and the popularity of diesel traction in the 1930s, particularly the celebrated *Lyntog* or "lightning" multiple units, which led to a virtual cessation of steam locomotive construction at this time, the policy was reversed during the war years and both new locomotives and rebuilds were to appear well into the 1950s from the DSB workshops or more usually from Frichs of Aarhus when new construction was involved. The steam locomotive fleet reached its peak in 1952 after which a gradual decline in numbers began, hastened by the influx of diesel locomotives, and by the end of 1954 only about 50 per cent of traffic on the DSB was steam-hauled. Yet even in 1962 there were well over 300 steam locomotives of some 20 classes although many were in store or otherwise inactive.

Six main classes of express passenger engines must be mentioned, the oldest type being the outside cylinder Class K 4-4-0s (Nos 501-600) designed by Otto Busse, of which the first five were supplied by Neilsons of Glasgow in 1894 and the remainder from various German and Italian builders between 1896 and 1902. These machines, weighing 42 tons with 6ft 1½in driving wheels and a boiler pressure of 170lb/sq in, were capable of hauling a 200 ton train at 50mph. Many were rebuilt by the DSB at Copenhagen and Aarhus between 1925 and 1932 with Schmidt superheaters, piston valves and conical smoke box doors, but still retained the original Allan outside link motion. Their heyday was ended by the diesel railcars of the 1930s but, although 95 survived the second world war to perform well on secondary services, only a handful lasted until the 1960s but saw little or no use. Similar in appearance and principal dimensions, but with inside cylinders, were the 19 engines of Class C (Nos 701-19) of which the first five were built by Esslingen in 1903 and intended for services from Copenhagen to Kalundborg and the line to Falster. A further 14 were supplied by Schwartzkopf in 1909 and all were superheated in 1915-25 and spent their entire life in Zealand, Falster and Lolland.

Far more remarkable were the 33 elegant four-cylinder compound 4-4-2s (Nos 901-33) with 6ft 6in driving wheels, of which 19 were built by Hanomag in 1907-9 and the remainder by Schwartzkopf in 1910. When first built these were straightforward saturated engines, but Schmidt super-

LEFT: DSB class H 2-8-0 No 800 at Aarhus with the Railway Enthusiasts Club tour last September. No 800 was built by Borsig in 1923. Also in the picture is Vemb, Lemvig & Thyboron Railway 2-6-0T (Henschel 1911) No 5 on loan to the Mariager-Handest veteran railway.

RIGHT: A 4-4-0 on the mixed gauge. DSB Class C No 708 at Fakse on the East Zealand Railway with 790mm gauge 0-6-2T No 1 (Krauss 1914) of the Fakse Railway on the mixed gauge section to Fakse Ledeplass.



heaters were added shortly afterwards and they had an unusually high boiler pressure for Denmark of 215lb/sq in. The compounding system was of the Vaucrain type with two outside low pressure cylinders of 22½in diameter and 23½in stroke and two inside high pressure cylinders of 13½in diameter and the same stroke, each pair having a common piston valve with Heusinger valve gear inside the frames. Externally these were graceful machines with the typical conical smokebox and a huge wedge fronted cab with a large firebox spread well over the frames and wide enough to justify twin fire doors. Seventy tons in weight, these engines could regularly haul 400 ton trains at 55mph, although trials proved they were capable of still higher speeds. They were originally used on the heaviest expresses between Copenhagen, Korsør and Kalundborg, and in Jutland-Funen between Nyborg and Aalborg, and Fredericia and Esbjerg, but although displaced by Pacifics and diesels they continued to give yeoman service on other duties. Withdrawal did not begin until 1957, and even in the early 1960s they were often used on summer relief expresses. As the last survivor was not withdrawn until 1968, the class outlived the streamlined Belgian 4-4-2s by some years and could with justice claim to be the last active Atlantic type in Europe after a career spanning 60 years.

Although neat and elegant externally, and offering the benefits of standardisation, Otto Busse's designs with their small boilers were often underpowered and retained such old fashioned features as the Allan valve gear, clumsy outside eccentrics and Salter safety valves; after his retirement in 1910, an effort was made to produce a larger and more powerful locomotive. This was the Class R 4-6-0 (Nos 934-63), a cross between the Prussian P8 and S10 Types, which consisted of two distinct but externally similar types—a two-cylinder version (Nos 934-53) forming Class RI and built between 1912 and 1918, the remaining 10 having three cylinders, those built by Borsig in 1921 being designated Class RII and the last five, built by Frichs of Aarhus in 1924, Class RIII. All were fitted with smoke deflectors, had 6ft 1½in coupled wheels, 18½in by 26½in cylinders and 170 lb boiler pressure which was the standard pressure for most of the locomotives described in this survey. They were mostly employed as express engines in Jutland and Funen, although a few found their way to Zealand in the second world war. There were also three Prussian P8 4-6-0s which were left in Jutland after the second world war by the Germans, being rebuilt by the DSB in 1948-9 and becoming Class T (Nos 297-9), but, although they were still in existence last year, they have not worked for several years.

The largest express passenger engines on the DSB were the 36 four-cylinder compound 4-6-2s of Class E (Nos 964-99) which had an interesting history. The first 11, which had been built by Nydqvist & Holm of Trolhatten in 1914-6, were bought secondhand from Sweden in 1936-7 for near scrap prices after they had been rendered redundant by

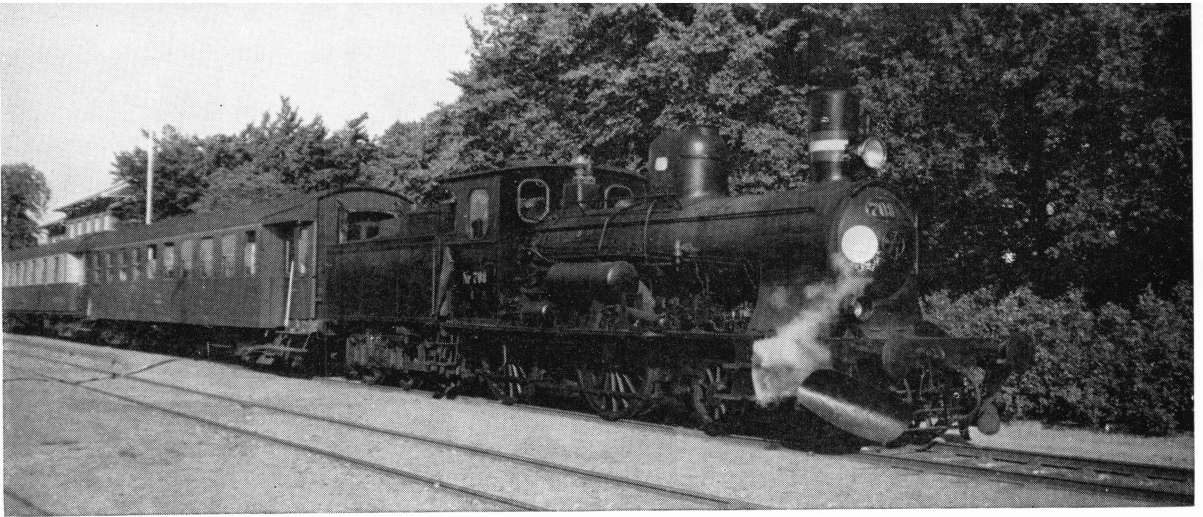
electrification. These fine engines, with 6ft 2½in coupled wheels, used a system of compounding similar to that in the DSB Atlantics, although the boiler pressure was a relatively modest 185 lb/sq in with high pressure cylinders of 16½in diameter and 26in stroke, and low pressure cylinders 24½in diameter and the same stroke.

Rather surprisingly the DSB obtained a further 25 locomotives from Frichs of Aarhus between 1942 and 1950 to the same basic design but incorporating certain improvements to the grate, a steel cab instead of the wooden Swedish type, and providing an extra 'dry steam' dome with water separator. Many of the class were also provided with double blast pipes and chimneys which, apart from any enhanced performance, improved their appearance considerably compared to the disproportionately small single chimney sported by some of the class. Weighing 88 tons, they could pull a 350 ton train at 70mph and were the principal express engines in both Zealand and Jutland-Funen, where, although replaced on many duties in the last 15 years by the influx of diesel locomotives, continued to perform on a limited scale on freight until last year in the latter area.

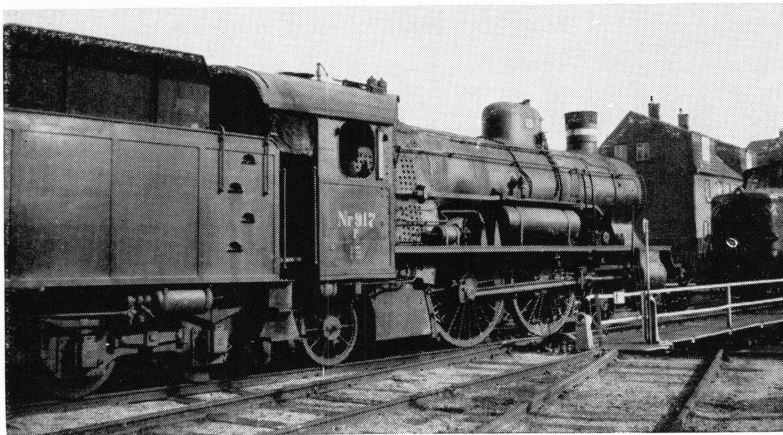
In 1943 the first of seven Class PR 4-6-2s emerged from the DSB works in Copenhagen for although new Class E locomotives were being constructed, a need was felt for a similar engine with a lighter axle load. These remarkable engines were rebuilt from the Class P Atlantics with a reduction in boiler pressure to 185 lb/sq in and new driving wheels of 5ft 8in diameter. To accommodate the extra pair of coupled wheels, the original bar frames were merely extended backwards by plate frames and the boiler lengthened by an extra short-coned ring, but while a new firebox, standard with those of Class R, was fitted, the cylinders and motion remained unaltered and as the maximum axleload was only 16 tons these unusual engines were suitable for use on secondary main lines. The last of these conversions was not completed until 1955, and the engines, which did not have a particularly long life in their new form, were put to work principally in the Esbjerg and Struer areas of Jutland.

Turning now to freight and mixed traffic locomotives, we must mention in passing the once numerous 0-6-0s of Class G, a two cylinder design with 4ft 6½in driving wheels built between 1875 and 1901. They were basically of the long boilered "Bourbonnais" type with outside cylinders and the firebox situated behind the rear coupled axles, although batches from different builders varied considerably in appearance. They do not really come within the scope of this survey as withdrawal began as early as 1931 and the last survivors barely lasted into the 1960s, their final duties being mainly in Copenhagen for working the numerous Brewery Sidings, or for steam raising. One, however, is still in use on the Høng Tølløse section of the Molback Private Railways in northern Zealand.

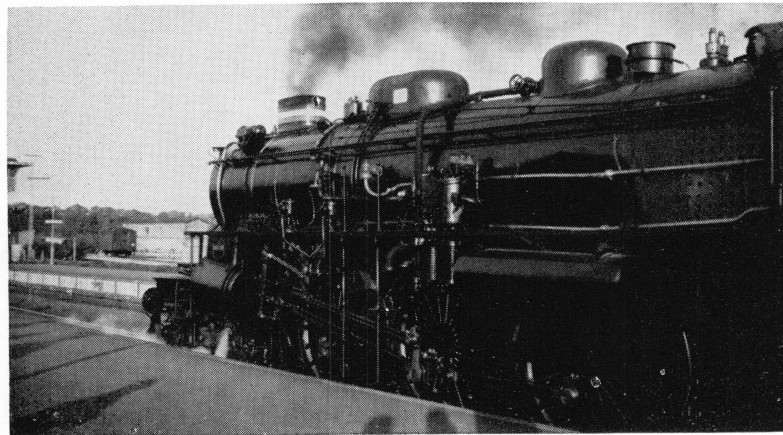
The most numerous type for freight and branch passenger workings was the outside cylinder Class D 2-6-0 (Nos



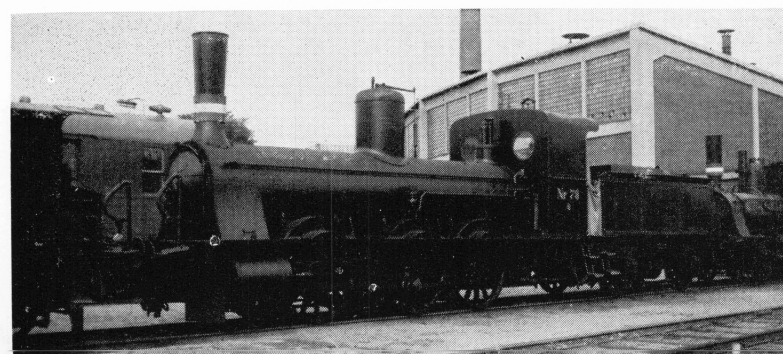
ABOVE: DSB class C inside cylinder 4-4-0 No 708 at Rodvig with the REC tour on the East Zealand private railway.



LEFT: The last working Atlantic in Europe, withdrawn in 1968, DSB Class P 4-4-2 No 907 having been hauled out of Naestved Shed on September 9, 1970.



LEFT: Profile of a Pacific—DSB class E 4-6-2 No 978 at Nykobing (Falster) on September 24 last.



LEFT: A museum locomotive at Odense; DSB class C 0-6-0 No 78 built by Kessler in 1875. No 625 of the same class, used on the REC tour and now belonging to the Hong Tollose Private Railway, built by Breda of Milan over 20 years later, differs in several details from No 78.

801-900) of which several batches were built with minor variations between 1902 and 1922. These were the first of Otto Busse's designs to be fitted with Walschaerts valve gear while their squat boilers, 4ft 7in driving wheels and high boiler mountings gave them an eminently Danish appearance. Apart from 13 which operated as saturated engines for one year, all were superheated, with two 18in by 24in cylinders and 170 lb/sq in pressure; the axle load of the heaviest was only 13 tons, while the top speed was 37mph. Although all were built in Denmark, some problems were encountered with raw material supplies after the first world war and a number were ordered from the Baldwin Locomotive Co Ltd in America, for final erection in Copenhagen.

The majority of the class were substantially rebuilt, the most important changes being an enlarged cab, piston valves (where not originally fitted), lengthened frames and a higher pitched boiler, with the maximum speed raised to 44mph which was particularly useful for special passenger workings at weekends. The locomotives treated in this way were Nos 801-51, 865-9 and 872, while certain engines from No 874 onwards were rebuilt with enlarged cab and lengthened frames only. Nos 852-64 and the remainder of the later engines survived in their original state and were mostly withdrawn by 1960. No 818 was notable in being the first DSB engine to be fitted with air brakes in 1939, which later became standard on the system. The whole class gave yeoman service all over Denmark and indeed was the largest type of engine regularly used for freight work in Zealand as the later 2-8-0s and 2-10-0s were confined to Jutland and Funen.

The year 1923 saw the delivery of the first two 2-8-0s which formed the basis of Class H (Nos 783-800). These two, Nos 799 and 800, were built by Borsig and were simple expansion engines with 18½in by 26½in cylinders, 4ft 7in coupled wheels and 170 lb/sq in boiler pressure. An interesting feature was the double return crank pin of the third coupled axle, driving the valves for the middle and left outside cylinders, a feature of all DSB three cylinder engines. The original Borsig engines were designated Class HI and a further 10 (Nos 789-98), built in Denmark by Frichs of Aarhus in 1926, became Class HII and the last six (Nos 783-8) also came from Frichs in 1941 to form Class HIII. There was little basic difference between these three batches and the whole class was allocated to freight duties on Jutland and Funen.

The last class of tender engines to be discussed are the Class N 2-10-0s (Nos 201-10) which were built to the standard two-cylinder Deutsche Reichsbahn Type 50 design with 4ft 7in driving wheels, but were part of an order of 100 under construction in Belgium when the war ended. In 1951 12 were bought from the SNCB and, although two were almost immediately broken up to provide spares for the rest, the remainder were put to work in Jutland and Funen where the survivors were still active last year.

Turning now to tank engines, two classes can be dealt with briefly, the first being the Class O 2-4-2 tanks (Nos 301-36) with 5ft 8in coupled wheels, built between 1896 and 1901 and used for local passenger turns in the Copenhagen area until superseded by Borsig 2-6-4 tanks, the last survivor being withdrawn for preservation in 1958. Of more interest were the four 2-8-2 tanks of Class Df (Nos 129-32), the 'f' indicating that the class was taken over from the South Funen Railway on the absorption of that system by the DSB on January 1, 1949. These two-cylinder locomotives with 4ft 8in coupled wheels were built by Henschel in 1917, and were originally owned by the Svendborg-Faaborg Railway. In later years all were based at Odense, but one is now owned by the Odsherreds Railway in northern Zealand.

The principal passenger tank engines on the DSB were the Class S 2-6-4 tanks (Nos 721-40) whose rather impressive appearance was enhanced by the fitting of large smoke

deflectors. These three-cylinder simples, with 5ft 8in coupled wheels and 17in by 26½in cylinders, were designed by Borsig and the first two were built by that company in 1924, the remainder being built by Frichs in 1927-8. They had the double return crank for the inside and left hand outside piston valves as on the Class H 2-8-0s. Weighing 98 tons they were capable of hauling 350 ton trains at speeds of up to 56mph with rapid acceleration. They were however plagued by exhaust troubles during much of their working life for they were fitted with condensing apparatus to minimise exhaust in the complex of tunnels surrounding Copenhagen. As the preheated water interfered with the working of the injectors, the condensers were removed. The other difficulty was the obscuring of vision from the cab and for this they were fitted with the seemingly excessively large smoke deflectors. Despite electrification of certain Copenhagen suburban lines in 1934, these engines continued to work on services in this area principally to Elsinore, Roskilde and Hillerød as well as other lines in Zealand and Falster until withdrawal commenced in 1961.

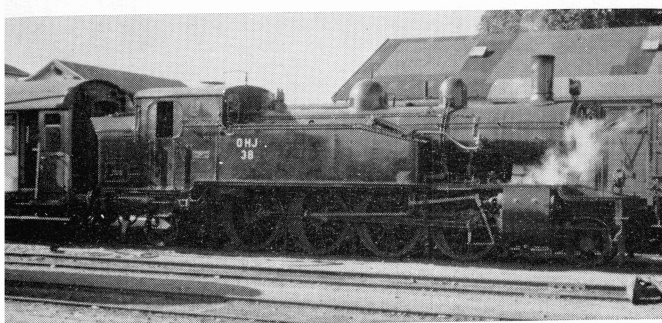
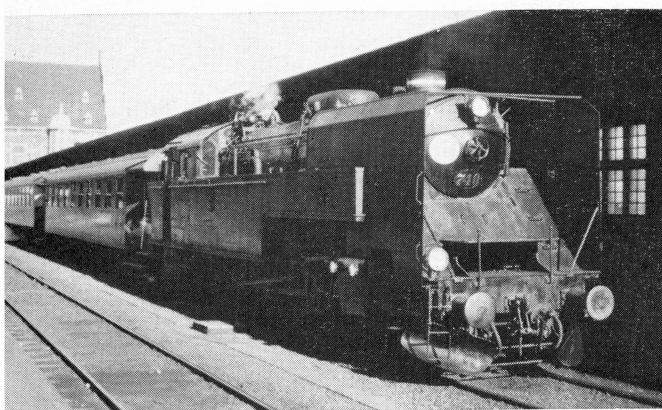
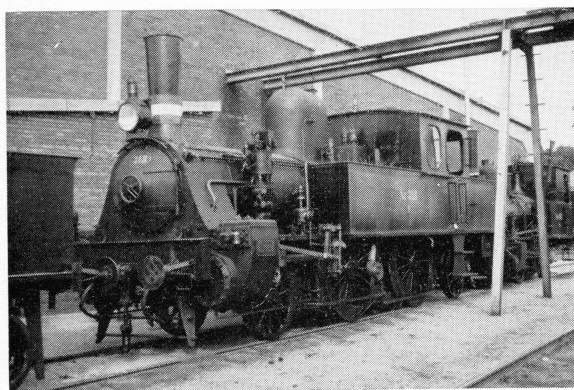
The fifteen 0-8-0 tanks of Class Q (Nos 337-51) were two-cylinder engines with 18in by 24in cylinders and 4ft 1in coupled wheels, built by Frichs between 1930 and 1945 for heavy shunting work. The majority were employed at Copenhagen, in Zealand, and at Aarhus, Fredericia, Padborg and Esbjerg in Jutland.

There were two classes of small tank engines for light yard work and servicing the various train ferries. The smaller of these were the 0-4-0 tanks of Class Hs (Nos 362-422), the 's' suffix to the code indicating that the original design was built by the Zealand Railways, in 1873, although the majority were obtained after amalgamation but before 1902, and five obtained from Neilsons in 1894, together with an equal number of Class K 4-4-0s, were the last engines built by British firms for the DSB. All were two-cylinder engines with 3ft 7½in coupled wheels and a few survived until the late 1960s although displaced on most duties by diesel tractors.

The most numerous class of locomotives on the DSB were the outside cylinder 0-6-0 tanks of Class F (Nos 423-500, 651-700). Although the original four engines of this type were built by Hawthorn of Newcastle-upon-Tyne as early as 1873-4, the first of the existing series came from Esslingen in 1898 and construction by various builders, mainly in Germany and Italy, was to continue for over 50 years, with only detail variation, for in 1949 the demand for additional shunters led to an order for a further 15 engines of which the last, No 665, was completed in 1950 by Frichs of Aarhus, whose very first locomotive had been No 444 of the same class in 1913.

These engines, with 4ft 1in driving wheels, 16in by 22in cylinders and a boiler pressure of 170 lb/sq in, have an appearance of considerable antiquity as even the last batch retained the Allan valve gear driven from an outside eccentric, the enormous dome which also contained the sand box, and the lofty stovepipe chimney. Eight engines of the class (Nos 428-435) which were in use for a long time at Padborg, differ considerably from the remainder, for they were built by the Swiss Locomotive Company of Winterthur in 1918, and have well tanks with no side tanks, cylinders of larger stroke than the standard design and superheated boilers. The class could be found all over the DSB system although the later engines tended to be concentrated in Jutland and Funen. They were employed on shunting duties and were particularly useful in locations where their light weight made replacement by diesels difficult.

As mentioned at the start of this very brief survey, although over 300 steam locomotives were in existence at the beginning of 1962, many were in store, and in describing the last years of Danish steam it is often difficult to decide when a class becomes extinct as the odd survivor, after a period of inactivity, would often be put to work again or



1 A 2-8-0 in the Danish Lake District; DSB Class H 2-8-0 No 800 pauses at Laken. No 800 is one of the two original class H locomotives built by Borsig in 1923.

2 A museum locomotive at Odense shed, DSB Class O 2-4-2T No 318, last survivor of 36 locomotives built between 1896 and 1901 for use mainly on Copenhagen suburban services.

3 DSB Class S 2-6-4T No 740 at Elsinore with the REC tour. This class was used on Copenhagen suburban services including those to Elsinore.

4 Odsherreds Railway 2-8-2T No 38 at Holbaek on September 21, 1970. This engine was built by Henschel in 1917 for the Svendborg-Faaborg railway and then worked on the South Funen Railway until taken over by the DSB in 1949 where it became No 130 of class Df. After ten years it was transferred to another private railway, then to the Odsherreds Railway in 1968.

used for steam raising duties. Even in 1962 in Jutland-Funen steam locomotives tended to be merely used on shunting or freight turns, as standby engines or for summer seasonal passenger trains but in Zealand both the Class E Pacifics and the Class S 2-6-4 tanks had regular passenger workings throughout the year. Sporadic activity at the main centres in Zealand involved Classes D, E, F, P, Q and S and in Jutland-Funen Classes D, E, F, H, N, Q and R although other classes were still in existence. By 1966 however, although there were 183 officially in stock, only 72 locomotives of 10 different classes were on the active list as follows: F (24), E (13), Q (12), S (6), D (5), N (4), C (3), R (2), H (2), and P (1), but others of the same type were in store together with members of a further four classes, not to mention locomotives set aside for preservation. Class C 4-4-0s could be seen on the line to Kalundborg and the last Atlantic was still active from Naestved although regular steam passenger working in the First District, comprising Zealand, Lolland and Falster, had declined to such an extent that it was originally intended to discontinue it at the end of the summer of 1967. However, in November of that year both Kørsor and Copenhagen had one turn each for a Class E 4-6-2 and Naestved held a Pacific as spare engine, while in the Second District of Jutland and Funen, Aarhus had four regular Pacific turns and Fredericia one turn for a Class N 2-10-0, although most were on Fridays and Saturdays only. The last Atlantic, No 917, had its final duty on a parcels special at Christmas 1967. All steam working officially ended in Zealand in the summer of 1968, leaving only two depots in Jutland—Aarhus and Fredericia—with regular steam passenger workings to Randers, Aalborg and Esbjerg for Pacifics and freight turns between Fredericia, Aarhus, Nyborg and Padborg where once again the Pacifics became the regular engines, although from time to time Class N 2-10-0s were used and an occasional Class R 4-6-0 or Class Q 0-8-0 tank could be seen on shunting duties. The end came in May 1970 when Pacific No 980 worked the last rostered freight between Fredericia and Kørsor, but this locomotive still works over DSB metals at Odense between steam raising duties at a local factory. Before steam was to disappear completely from the DSB, several types were to make a stirring departure in the course of a week long steam tour organised by the Railway Enthusiasts' Club in September, 1970. This was a fitting finale for the many fine engines with their distinctive bands of national colours on the chimney—a charming custom dating from 1867 on the railways of Jutland and Funen and introduced to those in Zealand in 1888, while other distinctive features such as the conical smokeboxes, tall chimneys and twin snow-ploughs, huge elongated domes containing sandboxes, and the acetylene gas bottles mounted on the footplate, will long be remembered with nostalgia by those who have known them.

Light railway news

W. J. K. DAVIES

WITH steam becoming rare almost to the point of extinction on the light railways of western Europe, it is heartening still to find some in regular service no further away than Northern France. Only a few hours out of Paris on the former Est main line are a group of what one might call 'light railways by adoption'; branches of the SNCF worked by a private company.

This in itself is something of an odd arrangement and stems from the great co-ordination scheme of 1938 when so many of the little metre gauge lines died. To provide some relief and employment for the big private concerns, a few of the dimmer sections of SNCF route were leased to them on the 'affermage' principle. SNCF provided the locomotives and stock—often superannuated main line equipment—and met the deficit. The private company had employment and took a proportion of any savings it was able to make.

The enterprising ones such as the CFD quite quickly provided their own diesels, cut costs and flourished. The Economiques people never really modernised; as a result their extensive system lost most of its passenger services in the last bout of closure. Nonetheless, for this very reason, it is their lines which provide the major interest for the average light railway enthusiast, since they retain steam. The first, a single branch, is only an hour from Paris, at Longueville where only the slow trains stop. It is slightly odd in that it used to be worked by the CF Secondaires which went to the expense of buying its own diesels; it was then absorbed by the CFTA who chopped the pleasant Billard railcars and replaced them by SNCF four-wheeled boneshakers of the 54XX series; even odder, while withdrawing the Sunday steam-hauled passenger trains which made up most duties for the collection of 2-6-2Ts and 2-8-2Ts that inhabited Provins shed, they took the one diesel locomotive away to one of their own lines and reinstated steam on the daily goods. Now the single track is open for all traffic as far as the hill-town of Provins (3km) and for



goods only on to Villiers St Georges, an incongruous clutter of industry in the middle of countryside. It used to extend to Esternay—the closure saved the cost of a junction—and you can still see and photograph 2-8-2Ts every day. But to see tender engines on a light railway you have to go further, to Troyes or to the still busy junction of Culmont Chalindrey.

From Culmont to Gray the line is even odder, for this was once part of the original main line route to Basle and the empty trackbed marching beside the present single line of rails bears witness to its former glory. Its sleepy stations and light track now lost in rolling country bear no other indication of its original importance but the huge sprawling

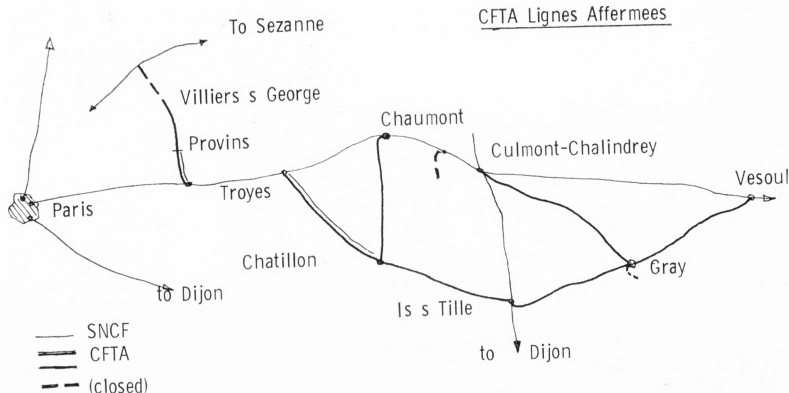


TOP: A train of the CFTA Franche Comte line crosses the viaduct over the Vingeanne river headed by a 130B 2-6-0.

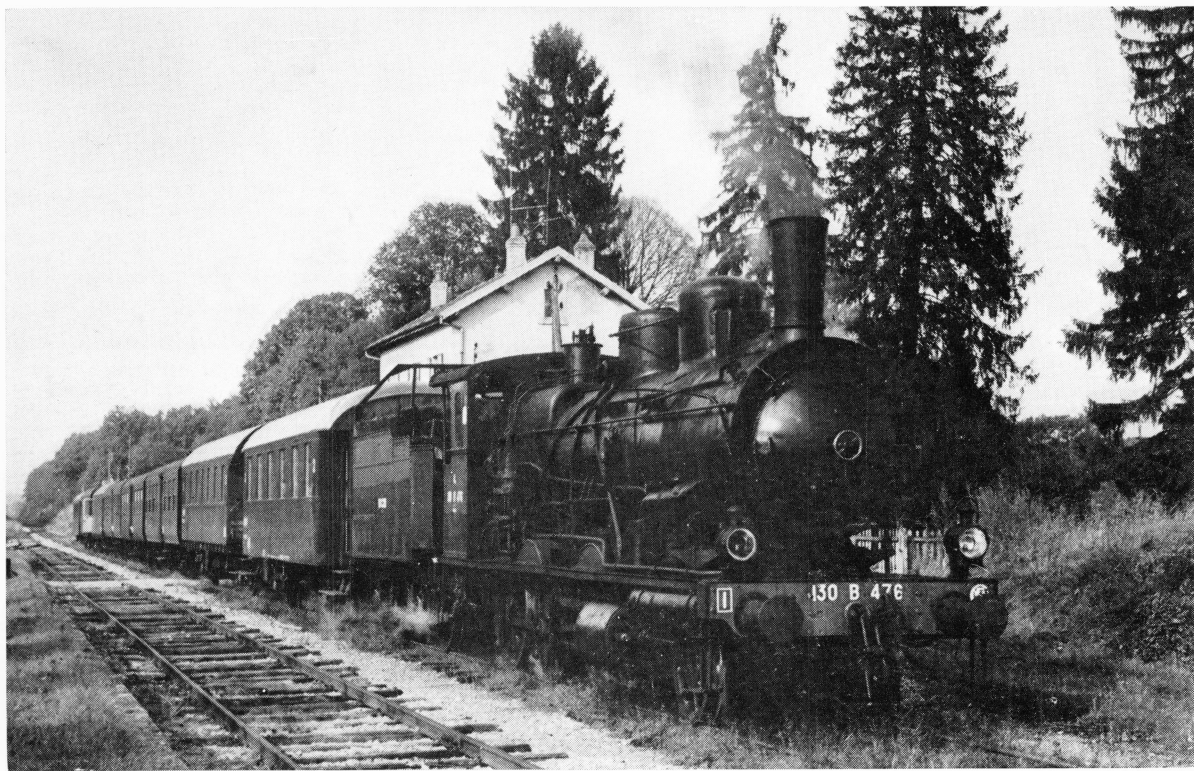
[W. J. K. Davies]

RIGHT UPPER: Mainstay of CFTA steam, a 2-8-0 of Class 140C at Gray.

[W. J. K. Davies]



RIGHT: Map of CFTA lines east of Paris.



ABOVE: A special train for the Continental Railway Circle last autumn on the CFTA Franche Comte line worked by 2-6-0 No 130B 476. [W. J. K. Davies]

junction of Gray does, even with its buildings decapitated and several of its serried ranks of platforms bereft of their tracks. Gray is still a junction of three branches and it is from here that the CFTA directs its sprawling network of Franche Comte. The still extensive shops are the repair centre for all the company's lines, adept equally at cannibalising a time-expired locomotive to keep others going, and at putting the 'chef's' car together again after an accident.

The Reseau goes east to Vesoul, north-west to Culmont and south-west to Is-s-Tille, with a long wandering extension through the charming town of Chatillon-s-Seine until it meets the Est main line again at Troyes. Chatillon, a

BELOW: 2-8-2 No 141TB 447 stands with a special train of the Continental Railway Circle on the goods only line to Villiers St George. [W. J. K. Davies]

sub-depot, is really the steam-centre since it provides three of the five daily steam diagrams and currently holds six of the ten serviceable 2-8-0s. A daily goods crosses the daily passenger train to and from Troyes and another makes regular forays up a goods-only link to Chaumont. Most of the rest are diesels, ugly Coferna B-Bs brought in from Montpellier which handle the goods to Is and Gray economically enough to keep the deficit to a reasonable figure. There are no passenger services other than the Troyes 'workmens' and the 2-8-0s are declining slowly while the last 2-6-0 goes at the end of this year. Its last outing may well have been the Continental Railway Circle special train pictured here.

Other news

Belgium: The TTA has acquired ex SNCV Type 18 0-6-0 tram loco No 1075 from the Charbonnages d'Antereau and also three railcars from Mol.

France: CF du Vivarais had a head-on collision on June 14, which suspended services for almost a month. Railcars 316 and 214 were badly damaged but there were no serious injuries and the railway has otherwise had a very good season. Trains have often had to be run in two portions. CF Regionaux which has taken over the western end of the Vivarais, from Dunieres to St Agreve, opened on August 16 using two ex CFD 100hp cars, an articulated car (CFD222) and 150hp X153 from the Corrèze. Steam is promised for next year.

Germany: The south German enthusiast club, DGEG has acquired a 75cm gauge Meyer 0-4-4-0T from East Germany and also an industrial 0-6-0T (Henschel 1919, ex Deutschen Barytwerk, Bad Lauterberg). They intend to run steam specials on the 75cm gauge Jagsttalbahn (Möckmühl-Dorzbach) next year.



New books

● Books published in the United Kingdom reviewed in this feature except those for which an address is shown are obtainable from Ian Allan Ltd, Mail Order Dept, Terminal House, Station Approach, Shepperton, Middlesex, at the prices shown plus return postage.

LNER ALBUM Volume 2 Brian Stephenson

Ian Allan 9½in by 7½in 112pp £2

(postage 10p)

During the summer of 1970, Brian Stephenson's LNER Album Volume 1, covering the Great Northern, Great Eastern and Great Central lines, was published and portrayed well the railways in the eastern half of the country. Now comes the companion volume covering North East England and Scotland. Like the first volume it is devoted entirely to trains in action and a few static locomotives but there are no photographs devoted specifically to such things as signals, coaches, stations or civil engineering features as have appeared in some of the companion albums from this publisher.

The selection of photographs is wide ranging, and the majority were taken in LNER days with about one third portraying the years of nationalisation. With originals from the cameras of such photographers as Hepburn, Hebron, Wethersett and Anderson, the quality is generally good but one or two have suffered in printing and are rather muddy. Classes portrayed range from inevitable Pacifics to the 2-8-2s, the various North Eastern and North British 4-4-0s and Atlantics to the multitude of goods and tank engines, and the Great Central and Great Northern types built for service in the North East and Scotland. Locations are bounded by such towns as Hull, Aberdeen, Keith and Mallaig. This book also provides the answer to a question which has baffled many locospotters over the years, 'what happened to LNER Pacific No 4469?'—G.M.K.

SALUTE TO THE GREAT WESTERN

Cecil J. Allen Ian Allan 9½in by 7in 64pp

75p (postage 5p)

In an attractively produced, if at times rather over printed, publication, part album, part reminiscence, CJ presents a compact survey of what must undoubtedly be Britain's most popular railway with chapters ranging from "Brunel the Engineer", "Churchward and his locomotives", "The Castles and Kings" and "Coaching comfort" to "The Cornish Riviera", "Safety" and the "GW Family Spirit". Much of it we have read before, many of the photographs we have seen before but does it matter? This is vintage CJ worshipping at Paddington's shrine and which cannot fail to interest those whose tastes lean towards copper capped chimneys and chocolate and cream coaches.—K.N.J.

THE RAILWAY CLEARING HOUSE HANDBOOK OF RAILWAY STATIONS 1904

Reprint David & Charles 10in by 7½in 600pp

£6.30 (postage 22½p)

Latest of the David & Charles reprints of official railway publications is the Handbook of Stations, a weighty volume

listing each station in alphabetical order with sub-divisions of named sidings and yards, and details of station facilities for handling passengers, parcels, freight, horse boxes, carriage trucks etc, the county in which the station is situated, the owning company and the nearest important station by which it can be located. The originals were not normally available to the public and few have reached the hands of enthusiasts. This edition of 1904 shows the railway system near its peak and will be of use to students and historians.—G.M.K.

RAILWAY HISTORY IN PICTURES—WALES AND THE WELSH BORDER COUNTIES

H. C. Casserley David & Charles

9½in by 7½in 112pp £2.50 (postage 10p)

From its title the latest of the David & Charles albums naturally covers much of the Principality, although not until one takes a dip does one find that it concentrates far more on the cross-country lines and branches and virtually excludes the principal South and North Wales main lines. It is nonetheless interesting for that, for its photographs portray the South Wales Valleys lines, the LNW and Midland incursions into the area, the Cambrian system and the narrow gauge slate railways in their original form and in their present capacity as passenger tourist lines. Photographs are accompanied by text in the form of extended captions; enthusiasts will find much of interest in this otherwise little publicised area.—G.M.K.

LOCO PROFILE No 4—AMERICAN 4-4-0s 8s

This is similar to the earlier parts in the series and includes descriptive text, black and white photographs and a double page spread of two typical 4-4-0s in full colour.

LOCOMOTIVES AND ROLLING STOCK OF THE SEVERN VALLEY RAILWAY 3s 6d

A 30-page well-printed booklet describing the locomotives and rolling stock in use on the Severn Valley Railway, with accompanying photographs; it is obtainable direct from the SVR, Bridgnorth Station, Shropshire.

CALENDAR

One of the more unusual railway calendars to be received in our office recently is that published by the Swiss Federal Railways. Of substantial size, 16in by 11½in, it contains 12 pages with one month's calendar details and a large size coloured photograph of Swiss trains in action per page. This year's calendar is entitled "The Swiss Federal Railways in all seasons" and the photographs, artistic in style, portray Swiss trains in settings identified by the weather or by flora. It is available, while stocks last, at 6 Swiss francs (11s 6d) from Service de Publicité CFF, Mittelstrasse 43, 3000 Berne, Switzerland.

BELOW: Watford Public Library has recently published a series of 14 facsimiles of prints depicting the town in the 18th and 19th centuries, and some include railway scenes as, for example, this train of the London & Birmingham Railway. Others are pictorial views of structures as the Colne Viaduct and Watford Junction in 1860. They are obtainable at 3s each from the Central Library, Hempstead Road, Watford WD1 3EU.



RIGHT: The RHDR non-stop special, hauled by No 10, passes Burmarsh Road crossing on September 20, 1970.

[Miss A. Miller



RHDR non-stop run

ON September 22, 1968, the Romney, Hythe & Dymchurch Railway Association sponsored jointly with the East Kent Model Railway Society the running of the first train to operate right round the RH&DR, 27.6 miles, non-stop. For the benefit of those who do not know the railway it should be explained that this is possible because Dungeness station is not a terminus in the accepted sense of the term, as it is built on a half mile loop, making reversal unnecessary. On this occasion the train was double-headed by English type Pacifics No 1 *Green Goddess* and No 3 *Southern Maid*.

As the trip proved to be so popular and was obviously enjoyed by all who travelled, a similar run was made on September 21, 1969, this time sponsored by the RH&DRA alone. The locomotives used were No 10 *Doctor Syn* and No 9 *Winston Churchill*, both Canadian Pacific type locomotives.

On September 20, 1970, the third non-stop special ran. Although the numbers of passengers travelling was up compared with last year only one locomotive was used, No 10 *Doctor Syn*. At 13.05 the train drew out of Hythe station, dead on time. In spite of the heavy train, consisting of 16 bogie coaches and a 4 wheeled luggage van, full speed was quickly attained. The sun shone brilliantly so two open coaches had been attached to the front of the train providing ideal conditions for tape recorder and cine enthusiasts. Everything went without a hitch, though sheep on the line nearly spelt disaster near Dymchurch, and the 27.6 miles were covered in 1hr 15min. Although the run was naturally scheduled at a higher average speed than that required for a timetable stopping train, speed restrictions were rigidly observed and safety was regarded as of para-

mount importance. However, conditions could not have been better and this must surely be a world speed record for a steam operated railway of only 15in gauge.

On arrival back at Hythe the enthusiasm of the passengers was readily apparent as the driver, Jim Fraser, who had handled the locomotive so capably was almost mobbed by those seeking his autograph. After servicing the locomotive most passengers rejoined the train and returned to New Romney where the engine sheds were open for inspection. During the day some members of the party covered 44 miles on steam hauled trains, a rare opportunity in these days of diesel and electric trains on BR.

The special train run in 1968 was unique as it was the first on the RH&DR to run the full 27.6 miles non-stop. The 1970 run was equally unique as it was the longest non-stop steam-handled passenger run of the year in England. Moreover on the quarter scale RHDR track this is equivalent to a distance of 110 miles on 4ft 8½in gauge.

Not all the locomotives are suitable for hauling these trains, No. 2 *Northern Chief* has a small capacity tender and the water supply would, therefore, be inadequate; No 5 *Hercules* and No 6 *Samson* are also unsuitable as they are of 4-8-2 wheel arrangement. With driving wheels 6in smaller than the Pacifics the additional revolutions would result in the mechanical lubricators running dry.

It is hoped to run further trains of this type from time to time. With its long straight stretches of track, 8¼ miles of which is double the RH&DR is the only remaining British steam operated railway which is able to run express trains at scale speeds of up to 75mph and put its locomotives through their paces on long non-stop runs.

Letters

Railway Closures and the Law

SIR,—

Your correspondent O. H. Prosser (October issue) refers to the postponement of the withdrawal of the North Fife line services from Perth to Dundee by legal action on the part of certain local authorities in Fife. Readers may be interested to know more details about this incident. (I have taken the facts from the report of the subsequent hearing in the Court of Session: 1951 Session Cases, p499.)

Closure of the Newburgh-St Fort line, and the withdrawal of all services between Perth and Dundee via this route, was first proposed by British Railways in January 1950. The proposal was viewed with some disquiet by local authorities in the area, who endeavoured to persuade BR not to withdraw the service before an adequate bus service was introduced. The local authorities were joined by the

Scottish TUCC, in calling for alternative bus services to and from Dundee, although the latter body did not formally oppose the closure. BR accepted the need for additional bus services, and postponed closure until a licence was granted to a local operator (Alexanders) on June 26. The very next day it was advertised that closure would take place on July 3; and no doubt it would have done, had not the Fife County Council obtained an interim interdict on June 30. The basis of the court action was that BR was failing to adhere to its duty (imposed by the Transport Act), of providing reasonable rail services in the area. When the case came before the Court of Session on January 25, 1951, it was thrown out with very little hesitation by the presiding judge, Lord Blades, on the grounds that, whatever the merits of Fife County Council's claim, the Transport Act had expressly given the task of determining whether a



RIGHT: The Norwegian 2-8-4 No 463 *Dovregubben* referred to in the accompanying letter. [NSB]

reasonable service was being provided to the Transport Tribunal. Because of this, the question was simply one which the court could not decide; consequently the action failed. Services were presumably withdrawn soon after this decision, although the report gives no information on the precise date.

Because of the ruling on the point of jurisdiction, the judge did not even have to consider three further weighty legal objections which BR had raised, each of which alone could have sufficed to kill the case.

In addition to this case, I believe that the closure of the Bluebell line was delayed after a successful court action by a local resident. This decision does not appear in the Law Reports, and I cannot supply any more details of the case.

The North Fife case in fact holds the key to the comparative absence of previous court cases on railway closures: while the courts are naturally the most suitable body to deal with procedural irregularities in closure proposals, they are less well fitted to assess the merits of a decision that a particular route is not economically or socially justifiable. As with similar decisions in other fields, the courts are content to leave things to the experts, and will intervene only in the highly unlikely event of a clear abuse of the powers concerned. Hence this is a subject which seldom troubles the courts.

University of Edinburgh

PETER WALLINGTON

Norwegian Steam

SIR,—

Further to letters that have been published on Norwegian steam, the accompanying photograph shows *Dovregubben* itself, the official name given to No 463 (Type 49) the first of the seven similar locomotives placed in service with the NSB between 1935-46. No 463 was built in Norway by Hamar-Thune; all seven of the class were named, but only one, the first, received its name plate, strangely enough not on the locomotive but on the Vanderbilt type tender. The class has always been called by the Norwegian public *The Dovregubben*, which means, literally, the old man of the mountains. The Dovre is the range of mountains between the south and Trondheim and these locomotives spent all of their working life on the Dombas-Trondheim stretch.

From the opening of the line in 1921 the Dovrebanen had been well served by class 30b 4-6-0s to cope with the heavier trains of the early 1930s on this line, which has many 18 0/00 gradients; the NSB planned a new class, the largest ever built in Norway and as it turned out, in Europe. They were four-cylinder compound machines with a 2-8-4 wheel arrangement. The first three, Nos 463-5 were built by Hamar and Thune in 1935/6. The first two were classified 49A while No 465 was of class 49B since it was heavier because of the booster driving the rear bogie; the booster was later removed. The effective horse power was 2,600 and the locomotive could haul 500 tons at 55kph on a 15 0/00 gradient or 1,000 tons on a 7 0/00 gradient. This

was remarkable for a locomotive with an axle loading of 15.6 tons.

A further four locomotives of Type 49C were built later, Nos 470/1 by Krupp of Essen in 1940 and 472/3 by Thune of Oslo in 1941. No 470 is in the NSB museum at Hamar; all seven engines were taken out of service in 1958 and only at the last moment was one saved for the museum. It was chosen as it was in the best condition and is not a hybrid of the other machines. A Swiss railway club has been talking for some time of the possibility of overhauling *Dovregubben* to take it on a European tour; a figure of £15,000 has been quoted for this operation.

Mr Garvin's observations on steam still being at Drammen are quite true, for steam locomotives have been in use at Kongsberg for the Nummedal line to Rodberg; in July, Type 21 Nos 207, 252, 225, also type 24b No 236 were there. They have been used on freight trains three times a week. But from June 1970 onwards even this use of steam ceased and the locomotives are used only for local ballast trains. It seems that the end of steam in Norway on a timetabled train was then No 252 on May 27 1970, from when it can be said that the NSB has not used steam on scheduled services.

Saffron Walden, Essex

GERALD PAGANO

Deltic power

SIR,—

In the September issue Mr Cecil J. Allen refers on p388 to a Deltic run on the 11.30 Kings Cross to Leeds recorded by the Rev R. S. Haines in which Deltic No 9000 lost speed from 103mph by only 1mph on the 1 in 178 up to Stoke Summit.

Taking this at its face value and assuming the train consisted of eight coaches of 276 tons tare and about 290 tons full, the power output required would be some 2520 equiv. dbhp, under normal service conditions, at a mean speed of 102½mph.

Now this is something like 430dbhp more than a Deltic is supposed to be capable of at such a speed, representing as it does a combined output from both engines of almost 4000bhp.

Since the laws of motion are fixed and cannot be either stretched or bent, there must be something wrong somewhere. Where?

Now it is readily acceptable that individual differences between power units do exist and on the test-bed variations in power of the order of plus or minus 2 per cent or so may well be found, though usually downwards rather than upwards.

But in this instance we have to account for an extra 20 per cent or so from somewhere, which is clearly very much more than can be expected from variations in engine governor or fuel pump settings, manifold pressure, or even in this instance from a favourable wind.

One must look therefore to the log. For instance, in

what precise period of time was 1mph lost? How was this assessed? By speedometer in the engine cab or by stop-watch on $\frac{1}{4}$ mile posts? If the latter what was the probable error in the stop-watch readings. 102mph is $\frac{1}{4}$ mile in 8.81sec and 103mph is $\frac{1}{4}$ mile in 8.735sec. How were such very fine intervals of time measured with such precision? If the error in reading a stop is $\frac{1}{2}$ sec, more or less, this gives a tolerance of $\frac{3}{2}$ sec which represents about 5mph at 102mph.

And if this happened in 1 minute we can immediately account for 430hp, and more. What is the answer? Perhaps Mr Haines would kindly look at his notes once more and see whether he can assist in providing any further clue, because there must be an answer somewhere.

Hayes, Kent

J. N. C. LAW (*Gp Capt*)

Loading gauges and 4-8-4s

SIR,—

Further to the letter from Derek Cross in your August issue, the New Zealand loading gauge is actually very restricted compared with other narrow gauge railways throughout the world, being 9ft 0in wide by 11ft 6in high although some recent diesels have gone an inch or so higher and the new de-luxe rolling stock is going to be 9ft 9in wide.

On the 3ft 6in Alice Springs line of the Commonwealth Railways discarded rolling stock from the standard gauge East-West line is used and passenger cars can be up to 10ft 3in wide and 13ft 6in high while, in addition, there is what they call their "relaxed" loading gauge which allows road vehicles on flat cars, up to 16ft high!

Recently I was in Manila and, on observation, I would judge the newest steel passenger stock there to be at least 10ft by 13ft 6in.

Mt Eliza, Vic 3930,
Australia

J. F. T. GRIMWADE

SIR,—

The figure in Mr Stelling's letter referring to 150 Class 25 locomotives on the SAR is incorrect; the SAR took delivery of 50 Class 25NC and 90 Class 25C locomotives in 1953, all of which still remain in service. On July 1 1970 they were allocated as follows:

	25NC	25C
De-Aar	38	9
Beaconsfield (Kimberley)	12	21
Beaufort West	—	60
Totals	50	90
Grand Total	—	140

Cleethorpe, Lincolnshire

B. N. CAMPBELL

SIR,—

May I correct a misleading statement by D. Cross, regarding the six KB Class coal-fired 4-8-4 locomotives of the New Zealand Railways, referred to in your August issue.

Mr Cross states that the six engines were built at Hutt Workshops in the North Island. The six engines, Nos 965-970 inclusive were built by the Hillside Workshops near Dunedin, in the South Island in 1939. Their works numbers are: 965 Works No 348 Hillside 1939

966 Works No 349 Hillside 1939

967 Works No 350 Hillside 1939

968 Works No 351 Hillside 1939

969 Works No 352 Hillside 1939

970 Works No 353 Hillside 1939.

The list as set out above was culled from *NZR Locomotives—1967* published by the New Zealand Railway and Locomotive Society Inc. Place of construction and date of construction were drawn from the publication referred to, also *Locomotive Calvacade*, published by Reed and Palmer. Gurraveen, NSW,
Australia 2145

E. G. SKILLER

It was Penrith

SIR,

I notice there are two references in the correspondence column of the August issue to my picture of Stanier 2-6-0 No 13254, arising out of Mr Haresnape's book and subsequent article. The photograph was taken on June 7, 1935; the partial renumbering scheme inaugurated in that year was not fully implemented immediately, usually being carried out as and when engines went through shops for general overhaul. No 13254 did not in fact become 2954 until December 1935 and the numbering of that particular class was not completed until June 1936 when No 13258 became 2958.

The photograph was taken in Penrith station on the down through line; it was in fact a breakdown train including a small mobile crane from Carlisle.

As for the LNER notice board commented on by Mr Roulston, this arose from the fact that although the station was LMS property, North Eastern trains from Darlington also worked into it, and in fact had their own bay platform, to which I think they had exclusive use, although it was in no respect a 'joint' station.

Berkhamsted, Herts.

H. C. CASSERLEY

Bill Harvey

SIR,—

I was interested to read the group of articles in the October issue entitled "Bill Harvey—Steam engineer extraordinary", and particularly the reference to his skill in fabricating a new brass dome cover for *Gwynedd*. As many of your readers will know *Maid Marian* is housed at Bressingham, and on arrival there some of the brasswork was showing signs of nearly 70 years of wear and tear at Dinorwic; indeed the brass mouldings round the fire box had even been painted black. One weekend Bill Harvey was at Bressingham, and entirely on his own initiative, volunteered to take the mouldings away to see what he could do with them. A week or so later he returned with them, as good as new, and now they do much to enhance the appearance of *Maid Marian*. In saying thank you to Mr Harvey, may we, of the *Maid Marian* Locomotive Fund, wish him a long and happy retirement.

Unsworth, Bury,
Lancs

DOUGLAS C. CARRINGTON,
Chairman MMLF

Another tubular bridge

SIR,—

Why is it that so many items dealing with the NER are inaccurate or incomplete? The latest example is the article on tubular bridges in your September issue. What about the Stephenson tubular bridge at Brotherton, on the York & North Midland Knottingley branch? For years it was on the East Coast main line, until the Shaftholme Junction-Selby-York direct route was opened. Unfortunately the bridge was replaced more than 60 years ago but it is illustrated in various books dealing with the NER, including C. J. Allen's book.

West Ayton,
Scarborough, Yorks

K. HOOLE

Vandalism

Following the publication of the letter from the Middleton Railway Trust in the December issue the Trust has asked us to point out that the view of the Tramway Museum Society official was expressed in his private capacity and the Society as a body had not formed any opinion on the matter.

JANUARY, 1971

RIGHT: During October the LMR conducted test runs at speeds of 125mph between Tring and Cheddington with Class AL6 No E3173, which was modified with a false streamlined front-end and fitted with television equipment for observation of the pantograph.

[Colin Gifford]

BELOW: Class AL5 No E3083 in Scotland for trials on the Wemyss Bay branch is seen alongside a Glasgow emu in Shields Road depot during November.

[British Railways]



Motive power miscellany

THE autumn was marked by unusual workings by electric power in both the London and Glasgow areas. On November 8, the Locomotive Club of Great Britain chartered SR 4COR unit No 3135 for a tour of the LMR suburban dc electric lines. This had been made possible since last August by the conversion of the LMR lines from four to three rail electrification, thus bringing these routes into line with SR third rail practice. The excursion started at Victoria and after gaining the SW Division Windsor Lines at Clapham Junction ran via the Hounslow Loop to arrive at Richmond in the up direction where it transferred to the LMR North London line. Its itinerary then took in Broad Street, Watford, Euston and back to Willesden where, after a shunt to regain the High Level line, it returned to the SR via Richmond. The other instance of unusual working by electric power occurred during the latter part of November when two locomotives from the Euston-Liverpool/Manchester line, class AL5 No E3083 and class AL6 No E3136, were transferred to Glasgow to undergo trial running on the Port Glasgow-Wemyss Bay branch which includes a climb of 1 in 67 from Wemyss Bay Junction to Upper Greenock. The two locomotives were employed on 1000 ton freight trains to assess adhesion limits on the steep climb, both in running and in stopping and starting, to simulate conditions on the main line climbs over Shap and Beattock. On the existing West Coast electrified lines there are no gradients as steep as those between Lancaster and Glasgow.

Despite a shortage of class 50 diesel locomotives, which has led to the running of single locomotives on some

of the principal Anglo-Scottish services, and even substitutions by Brush class 47s or EE class 40s, class 50 locomotives have been reported on a number of Silverdale (Stoke)-Buildwas CEBG power station hopper coal trains. Among those noted in October and November were Nos 400, 412 and 420. On the Wolverhampton-Shrewsbury route foreign motive power has begun to infiltrate on the beet pulp and nuts trains from the Eastern Counties to Shrewsbury. First to be noticed was Brush type 2 No 5537 with the 12.16 Ely-Coton Hill on November 12 and numerous other similar units have appeared since. Although there has been an upsurge in the number of coal trains serving Buildwas power station, in contrast much less coal has been produced by Shropshire's only surviving pit at Granville near Donnington which traffic accounts for the survival of the truncated remains of the Wellington and Stafford line. At present this route is being singled. During November oil trains from the South West and South

Wales to the Midlands have been diverted, because of engineering works, via Hereford, Shrewsbury, Abbey Foregate loop and Wolverhampton. The trains involved were the 23.20 SX Cardiff-Soho Pool and 06.56 MX return, the 00.45 MX, 09.55 SX, and 15.10 SX Waterston-Albion and their return workings, and the 03.35 MX Llandarcy-Wednesbury and its return. These trains are normally worked by pairs of EE type 3s, though Hymek type 3s both singly and in tandem have been used.

The Christmas parcels season apparently got away to an early start for on November 23 the 17.24 Sutton Park-Wolverhampton parcels was extended to Shrewsbury and other additional workings were gradually introduced late in November and early in December.

The northbound Poole-York train made history on October 10 when it passed Leamington 3hr 21min late because of a buckled third rail on the Southern; both up and down workings of this train are noted for their late running. During November loco-





tive troubles led to altered working of the services and SR type 3s powered the 08.27 Southampton-Birmingham returning with the up York-Poole service following failures of Brush type 4s at Reading; on November 12 No 6518 took the train through to Birmingham, on November 16 6508 was in charge and on November 24 the duty fell to No 6530. On November 14 Brush type 4 No 1703, one of the four class 48 locomotives, was an unusual visitor to the former GW Birmingham main line with a special Garston-Maidenhead Ford car train; the locomotive was ex-works and appeared to have been converted to a normal class 47. On the same day Old Oak Common's class 31 No 5530 was noted at Leamington with the 23.23 Dover-Knowle empty car carrying train, and repeated the performance on Saturday, November 21. Most of the Toton-Reading/Eastleigh coal trains are now worked by EE Type 1s, the remainder being handled by BR/Sulzer type 4s. A Brush Type 2, No 5848, has been allocated to Holbeck, the first allocated member of the class to the erstwhile NER.

On October 31 locomotive-hauled trains worked over the Central Wales line; one was powered by EE type 3 No 6889 which worked an eight coach special for the Wirral Railway Circle and the LCGB, which included South Wales in its itinerary. Indeed additional trains still seem to figure prominently in WR operations; on November 10 and 12 mid-week shopping specials to Paddington ran from Weston-super-Mare, in the second case via Bradford-on-Avon and the Hawkeridge emergency spur, normally confined to rare weekend diversions. Mystery tours

have continued well into the autumn with Chester being a popular venue from South Wales. One notable train was a Weston-super-Mare - Shrewsbury excursion on October 31 which journeyed outward via Hereford and returned over the Central Wales route to Llanelli behind EE type 3 No 6887 and was the second locomotive hauled train over this route on that date. Unfortunately the steep climbs taxed the locomotive severely which lost about 40min on the run and delayed the Wirral Railway Circle's special mentioned earlier. Now that the route appears to have returned from the wilderness as far as the Cardiff Division is concerned, the authorities might well consider employing Brush type 4s instead of EE type 3s which have nothing in reserve. The normal dmU service over the Central Wales line appears to have little difficulty with the gradients.

A number of dmUs were employed during the month on rail tours including one on November 14 covering lines in the Bristol area and another on November 21 from Birmingham which toured Gloucester. On November 14 following the failure of the westbound "Torbay-Tyne" north of Birmingham a scratch special 16.20 Birmingham New Street-Paignton was hastily arranged, which, while being appreciated by Birmingham passengers, may not have been so welcome later on the journey since it was formed of a three-car suburban dmU without toilet facilities.

A number of movements of preserved locomotives and rolling stock were arranged on the WR during the month including on October 31 a special from Barry Docks to Gloucester for Hall class 4-6-0 No 4983 and 2-6-2T No 4588.

ABOVE: Some passengers at LMR North West London local electric stations on November 8 must have wondered if trials were being carried out with more luxurious stock than is normally used on the dc lines, but it was only an enthusiast special operated by the LCGB. 4COR unit No 3135, seen approaching Watford High Street, had run through from Victoria and included Broad Street, Euston and Watford in its itinerary. [J. C. Haydon]

The latter was detached and continued with diesel haulage to Bristol where it joined the Dart Valley 2-6-2T No 4555 for the onward journey to Totnes on November 2. Meanwhile No 4983 was joined by two Pullman cars Nos 54 and 245 for Tyseley; the Pullmans had originated from the Dart Valley Railway. On October 22 Somerset & Dorset 2-8-0 No 53808 eventually reached Radstock where it is to be preserved. Ebbw Junction appears to have received an allocation of BR/Sulzer type 2s Nos 5179/80/1/2, 7624/5 all from 55A and the first to be allocated to the WR. The pulverised fuel ash trains from Aberthaw to Puxton were expected to finish early in December.

The Southern commissioned two further sections of colour-light signalling at the end of November, the first on the Tattenham Corner branch from Purley and the second between Wimbledon and East Putney. The former was scheduled to be brought in over the weekend of November 21 but during preparatory work in the preceding week when mechanically operated points and signals at Tattenham Corner were disconnected and handsignalling was in force, a train became derailed and damaged some of the new equipment and the

conversion was not commissioned until the following week. Only one intermediate automatic signal is provided on the branch between Purley and Tattenham Corner at Chipstead in each direction. The East Putney line is used by LT District Line trains and by empty SR trains between Wimbledon Depot and Waterloo which normally run via the Windsor line to avoid an awkward move at Wimbledon to reach the depot from the main line. Train stops have been incorporated at stop signals for the District Line trains.

While reports circulating locally in the Scottish Border areas suggested that the Waverley route might be used for diversions while the Carlisle-Glasgow line was being electrified, two newspaper advertisements confirmed that engineers trains will be working on the Waverley line for about five months from November 16, principally for track lifting.

This move would appear to end finally the hopes of the Border Union Railway for the restoration of a privately run rail service between Carlisle and Edinburgh.

[For information for this feature we are indebted to Messrs R. O. Jones, C. Magner, D. T. J. Rollason, G. R. Hounsell, S. J. Wimbush, D. W. Wright, A. W. Smith, R. Jackson, '48151', John B. Gosling, C. J. Clark, C. Reeves, The Northern Railfans Club, L. H. Sullivan, D. Pickett, Jonathan B. Juby, Ian Fitters.]

Locomotive stock changes

THIS list is correct to the following dates: LMR, November 7; ER, November 7; ScR, October 31; SR, October 30.

LOCOMOTIVES REALLOCATED

London Midland Region: W/E October 17: 8000/1/4/3/7/8/10/7/34/41/6/8/59/60/1/5-ER. W/E October 24: Nil.

W/E October 31: 4139-10D.
W/E November 7: 1831-D16; 5203/5/8/9-D09; 5248/9/50/1/2/66, 7513/56/7/8/9/60/1-D16; 7545-D08; 7589-D09; 7606/18/9/21/2/3-D02; 7648/52/3/4/6/7/5/6/7-D08.

Eastern Region: W/E October 10 (additional): 170-52A.
W/E October 17: 8000/1/4/5/7/8/10/7/34/41/6/8/59/60/1/5-41A.

W/E October 24: 1100-55B; 1106-52A; 2062-32A; 3074, 3544, 4063-40A; 3078-51L; 3195-52A; 5517-30A; 5518/20/37, 5662/79-31B; 6742/5, 6913-52A; 6785, 8033-41A.

W/E October 31: 176-ScR.
W/E November 7: 166-52A; 1545/8, 1702-40B; 1783-41A; 5167/8-55A; 5179/80/1/2-WR; 5678-34G; 5685-41A; 5848-55A; 7624/5-WR.

Scottish Region: 4 weeks ending October 31: 170-ER; 176-64B; 6844/7/51, 6936, 8084-65A.

Southern Region: List dated October 30: 6554/5-73C.

LOCOMOTIVES WITHDRAWN
2260/72, 3638, 4052.

LOCOMOTIVE RECLASSIFIED
1703 from 48 to 47.

LOCOMOTIVES FITTED WITH AIR BRAKES
172/86, 354, 1703, 3666/8, 5545, 5684.

Club notes

Club secretaries are invited to send in brief details of meetings and other fixtures—but not public railtours—for this feature. Insertion is free of charge and copy, suitable for unedited publication in the style shown, must be submitted by the 25th of the month five weeks before publication.

The Railway Club

January 8: 19.00. Royal Scottish Corporation, Fetter Lane, London E.C.4. "Developments on the Southern".

January 18: (At the Club) 19.00. J. E. Norris "More from Austria".

January 30: Visit to the Victoria Line. Details and Prospectus: The Railway Club, 112 High Holborn, London WC1V 6JS.

The Railway Correspondence and Travel Society

January 4: 19.30. St. Giles Church Rooms, St Giles Street, Northampton. "Railway Archaeology".

January 5: 19.30. Livesey-Clegg House, Union Street, Sheffield. "Developments on the FR".

January 6: 19.30. Douglas Hotel, Corporation Street, Manchester. "South African Tour 1968 part 1".

January 7: 19.30. Spirax Group Social Club, The Park, Cheltenham. Films.

January 8: 19.00. Carnforth Hotel, Lancaster Road, Carnforth. "Low Gill to Clapham in the 1960s".

January 8: 19.30. Angel Hotel, Bridge Street, Peterborough. "A selection of old timers on glass".

January 14: 19.30. BR Staff Club adjoining Coventry Station. "The LNER main line south of Peterborough".

January 16: 19.30. Mechanics Institute, Skinnergate, Darlington. Films.

January 18: 19.45. South Oxford Community Centre, Lake Street, Oxford. E. R. Wethersett. "Several years of railway photography".

January 18: 19.30. St Giles Church Rooms, St Giles Street, Northampton. T. Rounthwaite "The GC in North Lincs".

January 19: 19.30. Livesey-Clegg House, Union Street, Sheffield. K. Plant and Dr L. A. Nixon. "Steam in action South Africa 1970".

January 21: 18.45 (Joint with SLS) Caxton Hall, London SW1. C. R. Gordon Stuart "East African Safari".

January 21: 19.30. Stroud Conservative Club, London Road, Stroud. "Fresh light on the GWR".

January 22: 19.30. 14 Whiteladies Road, Clifton, Bristol 8. D. C. Williams. "The Severn Valley Railway".

January 29: 19.30. Room 30, Police Offices, South Block, Platform 5, Preston Stn. "Highball Steam—around America with 447".

Stephenson Locomotive Society

January 2: 18.45. Livesey-Clegg House, Union Street, Sheffield 1. Prof W. A. Tuplin, D.Sc. "Great Northern Steam".

January 6: 19.30. Halls of the Bromley Congregational Church, Widmore Rd, Bromley Kent. Film show. "A Steam Miscellany in the Sixties".

January 8: 19.30. Room "E", 2nd Floor, Leeds Adult Education Centre, Harrow Rd., Middlesbrough. "Steam over Ais Gill".

January 9: 19.30. Adult School Room, Friends' Meeting House, 6 Mount Street, Manchester (just behind Central Library). "Link working at St Margaret's, Edinburgh".

January 13: 20.00. Ilford and West Essex Model Railway Club Room, behind Chadwell Heath Station. "The Longmoor Military Railway".

January 15: 19.00. Room 36, Newcastle Central Station (above main booking office). A. J. Boston. "Preservation and the work of the Consultative Panel".

January 16: 14.30. Great Northern Hotel, Wellington St., Leeds. A. J. Boston. "My own Reminiscences".

January 16: 19.00. YMCA, Mount Pleasant, Liverpool. AGM followed by "1970 Rail Tour of Portugal".

January 21: 18.45 (Jointly with RCTS), Caxton Hall, Caxton St, Westminster, SW1. C. R. Gordon-Stuart. "My Safaris Nos 5 & 6—further experiences in South Africa, Mozambique, Kenya & Uganda".

January 21: 19.15. Lyonsdown Church Hall, Lyonsdown Rd, Barnet, Herts. Film show. "Steam from the Bluebell to the Baltic".

January 23: 18.45. Mechanics Institute, Willow St, Accrington, Lancs. "Railways of the West Riding of Yorks".

January 23: 19.00. Bourne Hall, Ewell, Epsom, Surrey. Slides. "British Railways in 1961".

January 30: 18.30. Adult School Room, Friends Meeting House, 6 Mount St, Manchester (just behind Central Library). "The Dinorwic Quarry Railways".

February 13: 10.30-19.30. Barnet Centre, Lyonsdown Church Hall, Lyonsdown Road, New Barnet, Herts. Railway and model exhibition. Admission 2s (Children 1s, Family 5s) Details, K. Greenwood, Laurel Cottage, Prospect Place, London, N2.

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January 4: Bedford Branch, 19.30. Grosvenor Centre, Bedford. Illustrated talk by K. Dickinson.

January 8: London Branch, 19.15. Kings Stores, Wiggate Street, EC1. Colour slide show by B. Stephenson.

January 8: 19.30. Percy Boys Club Branch, New King Street, Bath. Members evening, projector available, visitors welcome.

January 11: West Midlands/SLS Joint, 19.45. Giffard Arms, Victoria Street, Wolverhampton. "35 years of steam" black and white and colour slides.

January 14: St. Albans Branch, 19.45. Town Hall, St. Peters Street, St. Albans. Mr Powell of BRB will present a talk on his career.

January 14: Kent Branch, 19.45. Puckle Lane, Social Club, Nunery Fields, Canterbury. 8mm film show.

January 18: Bedford Branch, 19.30. Grosvenor Centre, Bedford. Talk by a representative from London Transport.

January 20: North West Branch, 19.30. Station Hotel, Earlstown, Lancs. "Steam 70" colour slide show with continental atmosphere.

January 29: London Branch, 19.15. Kings Stores, Wiggate Street, E.C.1. Mr I. G. White, Project Manager, North West Route Development will present a talk on Weaver to Glasgow Electrification.

February 1: Bedford Branch, 19.30. Grosvenor Centre, Bedford. Films by O. F. Clarke.

The Railway Enthusiasts' Club

January 2: British Steam in action—slides by Martin Smith.

January 6: Part 2 of John Batts Spanish programme.

January 9: Film Show.

January 16: Germany and Czechoslovakia 1970 tour: slides by Jim McEwan.

January 20: The REC afloat: Bristol Avon and Birmingham.

January 23: Film show.

January 30: Brian Seaton's visit in 1970 to South Africa.

All meetings in the Clubrooms, 200yd from Farnborough station at 19.30. Details from Phil Hingley, 5 Wynford Close, Reading, RG3 3HX.

February 13: 19.00. Round Diamond School, Stevenage. "North Wales Narrow Gauge, 1970" members' slides. Details: foolscap sae to D. L. Percival, 7 New Close, Knebworth, Herts,

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The Northern Railfans Club (1952)

January 9: York Diesel Depot. Meet at the Station at 13.45. Details, Secretary, 13 Ravenfield Drive, Rotherham Road Estate, Barnsley, Yorks.

January 23: Doncaster Loco Works and Depots at Doncaster, Frodingham, Immingham and stabling points at Grimsby. Meet at Doncaster Station at 10.45. Places for works ONLY, meeting as above; all bookings to be made in advance to President, 17 Glenview St Cornholme, Todmorden, Lancs. (BR fee payable).

January 31: Crewe Loco Works; meet at the Victoria Ave entrance at 14.20, bookings to T. H. Smith, 380 Underwood Lane, Crewe, Cheshire. (BR fee payable).

Association of Railway Preservation Societies

January 30: 14.15. Friends House, Society of Friends, Euston Road, London, N.W.1. Annual General Meeting.

Great Western Society London Branch

February 27: 18.30. Ealing Town Hall, Uxbridge Road, Ealing W.5. Talk, Mr R. J. Hill, "Movement of the Great Western Railway Freight traffic".

Swindon Group

January 9: 19.15. Drove School, Swindon. Members' slide show.

Reading Group

January 29: 19.30. Inorganic Chemistry Lecture Theatre, Reading University Buildings, Whiteknights Park, Shinfield Road, Reading. Challenge quiz with Hampshire group.

Festiniog Railway Society, East Anglian Group

January 12: Annual Colour Slide Contest.

February 9: Alan Garraway, General Manager Festiniog Railway Company, films of LNER activities around Cambridge late 1930's.

March 9: M. Seymour and J. Reynolds, films and slides of overseas railway holidays 1970.

April 6: Capt Peter Manisty, Chairman ARPS. Talk. Meetings, 19.30, 24 Glisson Road, Cambridge, Secretary and details from M. D. Gates, 3 Dunsmore Close, Cambridge, CB5 8QY.

North Eastern LPG

January 22: 19.30. Bridge Hotel, Newcastle-upon-Tyne. M. Burns film show "Indian Steam".

Bradford Railway Circle

January 13: J. Thornhill, "More Odds and Ends".

January 27: C. E. Scholey, "The Nidd Valley Light Railway".

At The Centre, Idle Station, Bradford at 19.30.

Y Clwb Rheil Cymru

January 1: 19.30. "The Smelters Arms", Trewyddfa Road, Morriston, Swansea. Slide show "Belgian and Dutch steam".

January 9: Meet 09.00 outside Swansea High Street Station, visit to railway remains in Pontypool and Blaenavon area. Details and notifications to "Trewoon", 85 Eaton Crescent, Swansea.

January 15: 19.30. "Trewoon" 85 Eaton Crescent, Swansea. "The Wrexham, Mold and Connahs Quay Railway".

January 29: 19.30. "Trewoon", 85 Eaton Crescent, Swansea. "The East Lancashire Railway".

London Underground Railway Society

January 8: 19.15. Hammersmith Town Hall, London, W.6. A Railway Miscellany, C. R. L. Coles.

Hull & Barnsley Railway Stock Fund

January 5: 19.30. 117, Grafton Street, off Newland Avenue, Hull. Meeting and discussion.

Bath Railway Society

January 5: 19.30. Smith's Assembly Rooms, Bath. O. S. Nock. Presidential Address.

Brooklands Railway Society

January 20: 19.45. St. Charles School Hall, Melrose Rd, Weybridge. Timetabling on LSW Main Line by R. C. Bright.

Severn Valley Railway Co (Wolverhampton Branch)

January 4: 19.30. Meeting Room, Bradmore Community Centre, Bradmore Road, Wolverhampton. Film Show.

Kettering and District Locomotive Society

January 8: 20.00. "The George Hotel", Sheep Street, Kettering. "Steam Locomotives of Northern Spain". Details of membership etc from M. A. Coe, 29 Nichols St, Desborough, Nr Kettering, Northants.

Bournemouth Railway Club

January 9: 14.45. Rechabite Hall, Kemp Road, Winton, Bournemouth. Annual General Meeting followed by illustrated talk on Club travels during 1970.

January 16: 19.30. South Western Hotel, Holdenhurst Rd, Bournemouth. "Iberia '70" talk by Messrs Foot, Trickett and Wild (illustrated).

Dart Valley Railway Association Bristol & District Group

January 22: 19.30. Full Moon Hotel, Stokes Croft, Bristol. Films.

Hampshire & Dorset Area Group

January 15: 19.30. Temperance Institute, 30 Carlton Crescent, Southampton. Isle of Wight Railways (illus). Mr R. Newman.

Isle of Man Association (Southern & London Group)

January 22: 19.30. Abbey Centre, Marsham Street, Westminster SW1. Slide show. "1968 and all that".

Wirral Railway Circle

January 12: St Peter's Vicarage, 58 Park Road South, Birkenhead. J. Tolson. "Rail Tour Mania".

January 16: Visit by rail to York, including museum. Details: A. Bodlander, 15 Palmerston Road, Wallasey.

January 23: Visit to Liverpool Central Signal Box. 10.30. Details: A. Bodlander.

Worcester Locomotive Society

January 9 & 10: 25 depots and stabling points in Scotland. From Birmingham and Worcester.

January 25: 20.00. Commercial Room, Crown Hotel, Broad Street, Worcester. Meeting.

February 21: 14 depots in Hull and Frodingham areas, plus Doncaster Works. From London and Birmingham.

February 22: 20.00. Commercial Room, Crown Hotel, Broad Street, Worcester. Meeting. Full details, including membership for 1971, send foolscap sae to: D. Wood, 84 Broxholme Road, London, S.E.27.

Reading University Transport Society

January 19: 19.30. Room 103, Palmer Building, The University, Whiteknights Park, Reading. Slide Show. "Steam in the North-West".

Bulleid Pacific Preservation Society

January 6: 19.00. Brunswick House, Wandsworth Road, London, SW8. Members slide show and sale of railway miscellanea.

January 20: 19.00. Brunswick House, Wandsworth Road, London SW8. 8mm Cine Films.

Narrow Gauge Railway Society (London & Southern Area)

January 16: 19.30. Caxton Hall, Caxton Street, Westminster, London, SW1. The Corris Railway by D. K. Coleman.

Stour Valley RPS

Bishops Stortford Branch

January 21: 20.00. Railway Hotel, Bishops Stortford. Quiz. Bishops Stortford v. Sudbury Branch.

February 18: 20.00. Railway Hotel. Film show. Continental and Industrial Steam.

Ipswich Branch

January 5: 19.30. Museum Lecture Room, High Street, Ipswich. Steam in North Eastern England.

Chelmsford Branch

January 6: 20.00. St Johns School, Stock Road, Billericay. Slides.

Colchester Branch

January 8: 19.45. Friends Meeting House, Shewell Road, Colchester. Meeting.

Stratford upon Avon Railway Colour Group

January 22: 19.15. South Warwickshire College of Further Education, "The Willows", Alcester Road, Stratford upon Avon. "Steam at Home and Abroad". Details, M. A. Collins, 4 Evenlode Close, Stratford upon Avon.

Dalescroft Railfans Club

January 2: Teesside Branch. From Hartlepool, Ferryhill & Stockton to installations at York, Humberston and Immingham. Details: P. Bulmer, 2 Wellburn Road, Fairfield, Stockton, Teesside TS19 7PR.

January 10: East Midlands Branch. Visit to Derby Works, and installations at Toton, Nottingham, Coalville and Burton. Details: D. Goodwin, 24 Hawkhead Ave, Breadsall, Derby DE2 4EA.

January 16/17: West Riding Branch. Visit to London installations, Southampton, Bournemouth. Overnight accommodation provided in Bournemouth. Details: J. Speed, 506 Huddersfield Road, Wyke, Bradford BD12 8AD.

January 24: South Yorkshire Branch. Visit to Doncaster & South Yorkshire installations. Details: L. Wainwright, 52 Common Lane, Royston, Nr Barnsley, Yorks.

January 30: West of England Branch. Swindon Works, museum & Didcot. Details: S. D. Wheeler, 142 Brickley Lane, Devizes, Wilts.

Matlock Railway Club

January 4: 20.00. Crabtree Inn, Matlock. Film Show. This is York, Making Track etc.

January 11: 20.00. Greyhound Hotel, Cromford, Matlock. Talk. Cromford & High Peak Railway.

January 18: 20.00. Crabtree Inn, Matlock. Film Show. Locospotters, LNWR, Manifold Valley.

January 25: 20.00. Greyhound Hotel, Cromford, Matlock. Film Show. Dart Valley Railway, The Great Little Trains of Wales.

Membership 5s per annum. Details from C. W. Rawlins, 18 Wolds Rise, Matlock.

South Bedfordshire Locomotive Club

January 12: 19.30. Beech Hill High School, Dunstable Road, Luton, Beds. 8mm Film Show including the local steam scene from the past.

January 27: 19.30. Beech Hill High School, Dunstable Road, Luton Beds. Slide and 8mm film show of members own work.

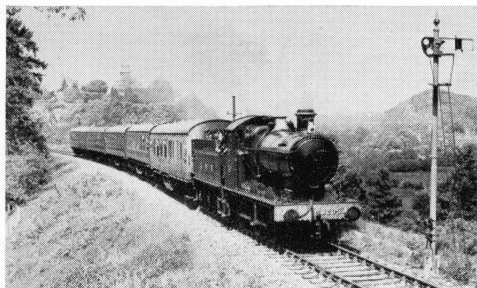
February 9: 19.30. Beech Hill High School, Dunstable Road, Luton Beds. 16mm Film Show.

Details of other meetings from the Gen Sec. SBLC, 107 Carlton Crescent, Luton, Beds.

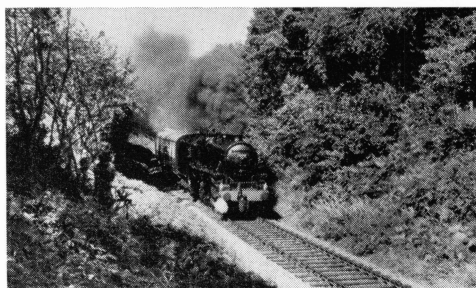
Northern Counties Transport Society

January 9/10: Week-end trip to London. Details from W. R. Hendry, 209 Warrington Road, Glazebury, Nr Warrington or from the N. R. Capelle, 130 Brocklehurst Ave, Macclesfield.

SEVERN VALLEY RAILWAY



GWR '2251' 0-6-0 No 3205 leaves Bridgnorth with a Hampton Loade train. 24th May 1970.



LMSR Class 5 4-6-0 No 45110 at Oldbury Grange on 20th September, 1970.

Regular weekend passenger services have now been restored on this picturesque $4\frac{1}{2}$ mile branch line between Bridgnorth and Hampton Loade, which follows the course of the River Severn. Although our summer service has now finished, steam trains will continue to operate on winter Sundays—except during January and February—and our timetable including the Saturday railcar service is shown below:-

		Saturdays until April 3rd (inclusive)		Sundays until April 4th (except Jan. and Feb)	
		D	D	S	S
BRIDGNORTH	dep.	10.30	13.00	14.30	15.45
EARDINGTON	dep.	10.38	13.08	14.45	16.00
HAMPTON LOADE	arr.	10.46	13.16	14.55	16.10
HAMPTON LOADE	dep.	11.00	13.20	15.10	16.25
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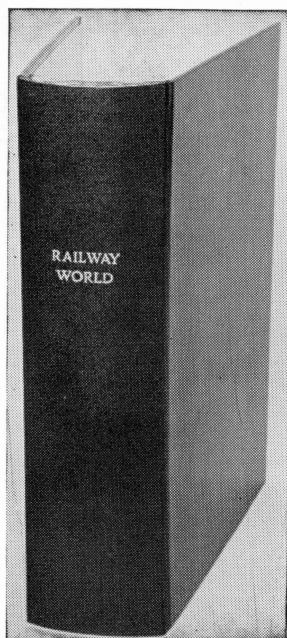
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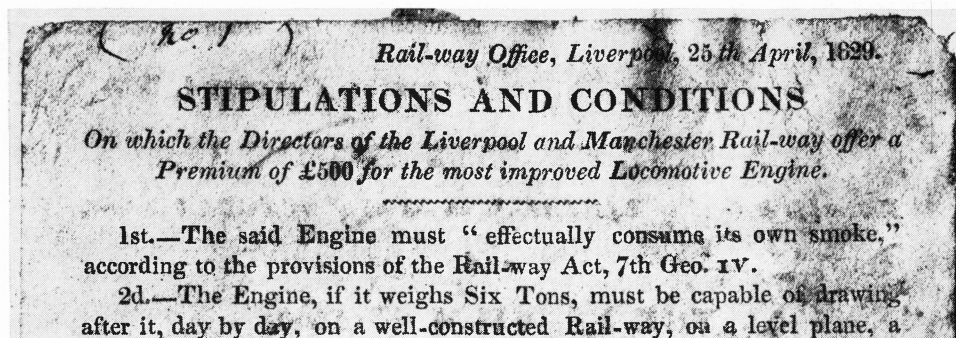
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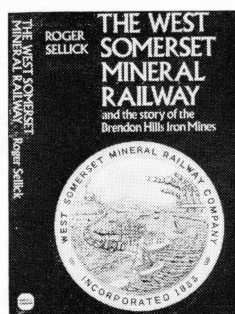
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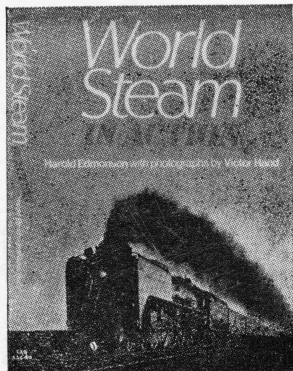
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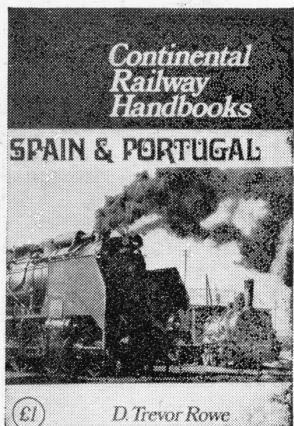
BOOK NEWS

STEAM STATUS



A giant 4-8-4 challenges the endless plains of America's West; a "Britannia" storms Beattock summit on a winter night; a French 241P accelerates through snow-covered countryside; a South African Garratt erupts black smoke; a 4-6-4 rolls the wheat crop of Australia; and double-headed Japanese "Hudsons" stream through the mountain passes of Hokkaido. US author **Harold A. Edmonson** and photographer **Victor Hand** in their delightful book **WORLD STEAM IN ACTION** (for publication at the end of January) search out and record every sparkling detail of their exciting subject to create a status report on world steam.

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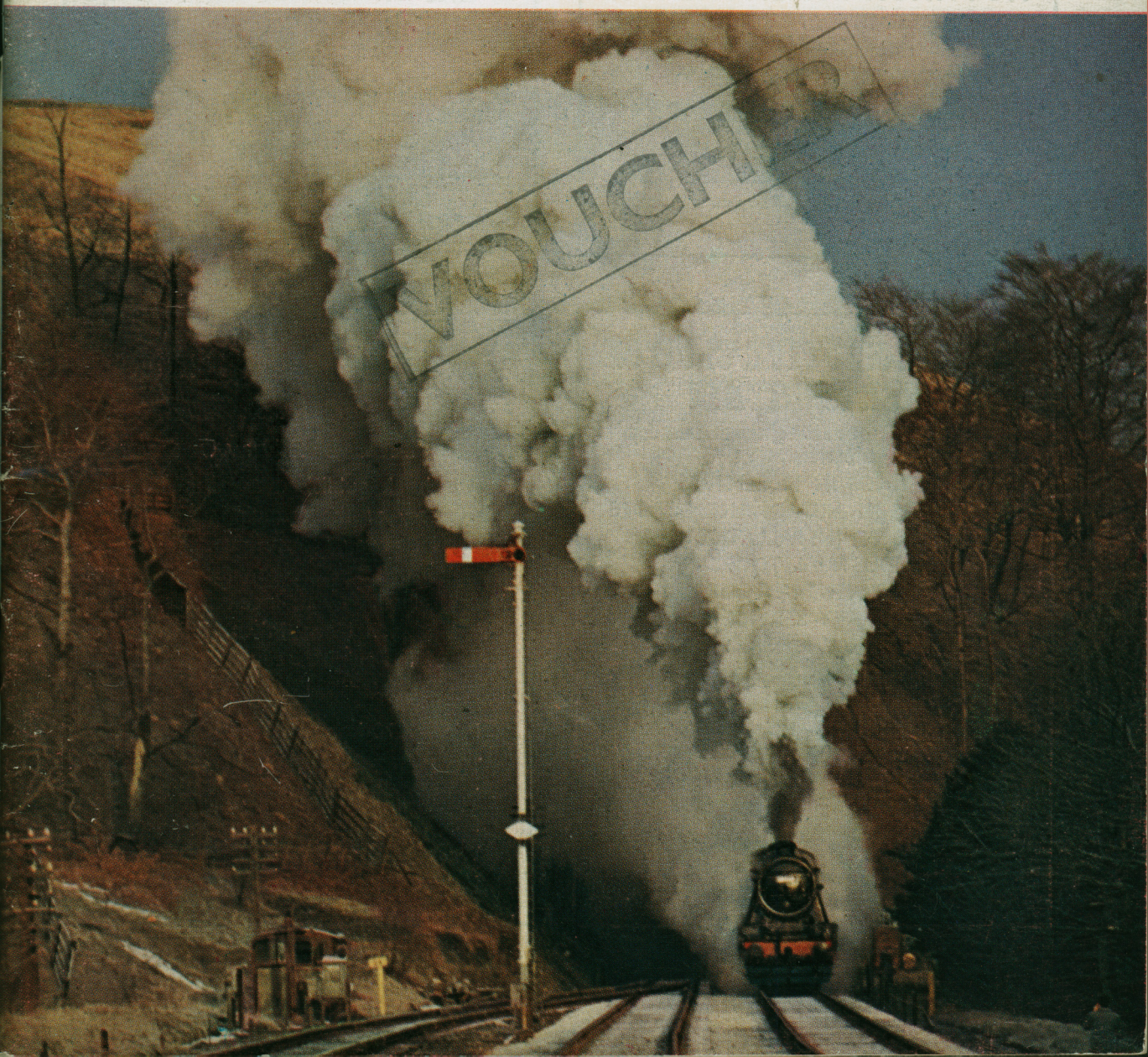
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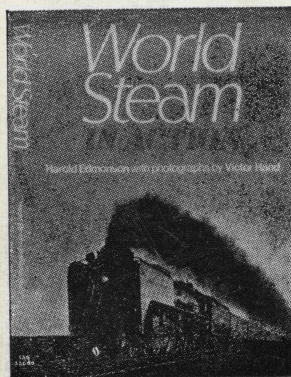
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BOOK NEWS

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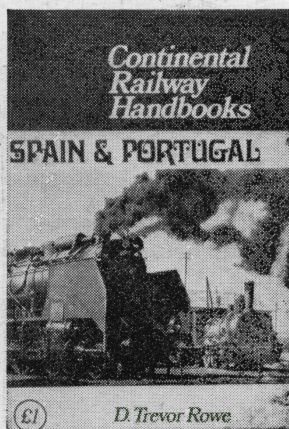
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